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ANALYSING BUSINESS INFORMATION NEEDS IN AN INTERNATIONALLY OPERATING COMPANY

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HELSINKI SCHOOL OF ECONOMICS
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Faculty of International Business
Master's Thesis
Markko Vaarnas

ANALYSING BUSINESS INFORMATION NEEDS IN AN INTERNATIONALLY OPERATING COMPANY

Case: Business Group Communication Networks of NKF Holding N.V.

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ABSTRACT

ANALYSING BUSINESS INFORMATION NEEDS IN AN INTERNATIONALLY OPERATING COMPANY

Case: Business Group Communication Networks of NKF Holding N.V.

Objectives
The objective of this study was to develop a comprehensive model for the analysis of business information needs, which can be applied to internationally operating companies in general. This objective was approached by first examining and determining various dimensions of the business information need within internationally operating companies and studying the existing need analysis methods for these dimensions. Based on this research, a theoretical model was developed, which was then tested in the empirical part of the study and further developed based on the findings.

Information Sources
For the purpose of this study, information has been obtained from three sources. First, a broad literature and article review was conducted in order to build the theoretical discussion of this study. Secondly, numerous company representatives were interviewed and observed in seminars to learn to understand the linkage between the theory and practice. Finally, a case study was conducted including brainstorming sessions, interviews and a survey, the analysis and observation of which gave valuable information for the developed need analysis model.

Methodology
The methodology for the empirical research was an instrumental case-study, which was conducted by testing the developed need analysis model in the case company. The findings of the case study were based on observations done along the need analysis process as well as the evaluation of the analysed results of the three phases of the model.

Results
The primary result of the study is a comprehensive model for analysing the business information needs in an internationally operating company. This model takes into account all the dimensions of business information need and its three phases can be specifically adapted to the company in question.

Key words: business information needs, information need analysis, business information, market information, business intelligence, information cycle

HELSINGIN KAUPPAKORKEAKOULU **TIIVISTELMÄ**
Liiketaloustiede: Kansainvälinen liiketoiminta
Pro Gradu-tutkielma
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Tavoitteet
Tutkimuksen tavoitteena oli kehittää kattava ja sovellettavissa oleva malli kansainvälisesti toimivan yrityksen tietotarpeiden analysoimiseksi. Tavoitetta lähestyttiin tutkimalla ja määrittelemällä ensin tietotarpeiden ulottuvuuksia kansainvälisesti toimivissa yrityksissä, jonka jälkeen tarkasteltiin olemassa olevia malleja tietotarpeiden analysoimiseksi näiden ulottuvuuksien suhteen. Tämän perustutkimuksen pohjalta muodostettiin teoreettinen malli, joka testattiin empiirisen tutkimuksen avulla ja jota edelleen kehitettiin havaintojen pohjalta.

Tietolähteet
Tutkimuksessa käytetyt tietolähteet voidaan jakaa kolmeen ryhmään. Syvällinen kirjallisuuskatsaus muodosti pohjan teoreettisella viitekehikolle, jota syvennettiin asiantuntijaseminaarien ja -tapaamisten avulla. Empiirisen osan tiedot kerättiin case-yrityksessä brainstorming-tapaamisten, haastattelujen ja kyselytutkimuksen sekä niiden toteuttamiseen liittyneen havainnoinnin ja analysoinnin avulla

Menetelmä
Tutkimuksessa käytettiin instrumentaalista case-menetelmää, jonka tarkoituksena oli testata aikaisemman keskustelun pohjalta luotu malli tietotarpeiden analysoimiseksi valitussa case-yrityksessä. Case-tutkimuksen löydökset pohjautuivat analyysiprosessin aikana tehtyihin havaintoihin sekä kolmivaiheisen tietotarveanalyysin antamien tulosten arviointiin.

Tulokset
Tutkimuksen päätulos on malli kansainvälisesti toimivan yrityksen tietotarpeiden analysoimiseksi Malli on kattava ottaen huomioon tietotarpeiden eri ulottuvuudet ja sen kolme vaihetta voidaan soveltaa kansainvälisesti toimivan yrityksen tilanteen ja tarkoituksen mukaisesti.

Avainsanat: tietotarpeet, markkinatietotarpeet, tietotarpeiden analysointi, tietotarpeiden määrittely, markkinatieto, liiketoimintaympäristötieto

Analysing Business Information Needs in an Internationally Operating Company -

Case: Business Group Communication Networks of NKF Holding N.V.

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1. Introduction

1.1. Description of the Research Area

In recent years, there has been lot of discussion on the management of future being actually management of information. The accelerating pace of changes in the business environment has driven most industries into a turbulence, where rapid and knowledgeable decision making is a critical asset both on strategic and operative levels. Thus companies that know more than their competitors and can utilise this information more rapidly have a competitive edge.

On the other hand, also the availability of information has been increasing dramatically with the introduction of new computer-based technologies such as the Internet. Consequently, the field of international business information is going through a major process of change both in terms of demand and supply, and for companies it is very difficult to keep up with the development.

To cope with the increasing turbulence both in terms of business information demand and supply and to enhance the decision making in strategic and operative levels by providing more accurate and timely business information, companies need to organise their management chain of business information in a more systematic way. This can be done by utilising, for example, the concepts of business intelligence or competitive intelligence. Whatever the utilised concept is, the first crucial step in the process is the analysis of the real needs of the business information users.

Academic discussion has presented lot of evidence that organisations and their information users and providers are not aware of the users' real business information needs. For example, Belkin's (1980) "anomalous states of knowledge" theory postulates that information seekers are often not able to specify their real information needs. They may recognise that a problem exists and that information might be needed to resolve it, but not know what information they need. According to Simpson and Prusak (1995), research and other types of information gathering activity are frequently hampered by a poor understanding of what the end-user actually wants or expects.

As a conclusion, it can be stated that the knowledge of business information needs is often poor and does not depend on whether the user of the information will be the information seeker himself, some other person or the organisation on the whole. The information seeker and user may have some perception of the need, which, however, may be far from the actual which can be found out with a thorough information need analysis (Rosén 1996, 51-52). The importance of a business information need analysis has also been highlighted, for example, by Gilad and Gilad (1985), Ghoshal and Kim (1986), Fuld (1991), Herring (1992), Bernhardt (1994), Allison (1996), Pirttilä (1997, 45-48), and Tyson (1997, 196-203).

1.2. Previous Research and Research Gap

There is lots of previous research in areas close to international business information such as marketing research. For example, Douglas and Graig (1983), Cavusgil (1984 & 1985), Gorton and Doole (1989), Hawkins and Tull (1994) and Hibbert and Liu (1996) have contributed to this topic. Contents from these works can partly be applied to this thesis especially in terms of their international aspects. The limitation, however, is that the research is very much oriented to marketing and not to international business management on the whole.

Previous research concentrating purely on international business information as such, and especially on the need for it, is quite limited both internationally and especially in Finland. On the international level, literature on business information itself is mostly dealing with sources of information, examples being the works of Walters (1983) and Wheeler Strauss (1988). In addition, the reports on this field have been mostly done from librarians' point of view rather than from information users' point of view. Consequently, their relevance to analysing business information needs is quite limited.

With the introduction of the concepts of Executive Information Systems, Business Intelligence and Competitive Intelligence, there has evolved a new school of academicians and consultants who have contributed a lot to academic discussion in the field of business information. In these new concepts, an analysis of information needs is one of the crucial steps when building up a systematic business information management process. Even though, most of the authors in these fields have highlighted the importance of an information need analysis, only few of them have tackled the issue with a deeper insight.

Regarding Executive Information Systems, some aspects of information need analysis have been covered by Wetherbe (1991), Watson and Frolick (1993), and Allison (1996). Similarly, Gilad and Gilad (1985), Ghoshal and Kim (1986), Fuld (1991), Herring (1992), and Bernhardt (1994), have covered some issues related to information need analysis when building up Competitive Intelligence or Business Intelligence systems. The paper concentrating most purely on the analysis of business information needs has been, however, written by Rosén (1996), who has taken a more generic approach to the subject. Moreover, some consultants such as Hedin (1998) and Tyson (1997) have been working extensively in creating models for information need analysis.

In Finland, the most active authors in the field have been Suomi (1994), Pirttilä (1997) and Huotari (1997), who have taken an academic approach to business information management and covered analysis of business information needs to some extent but not as the core element of their studies.

As a conclusion, it can be said that there is relatively large amount of previous research on various aspects of analysing business information needs. However, very few authors have taken this subject as the core element of their study or concentrated fully on this research area. Consequently, several research gaps can be identified.

First of all, there is no up-to-date information on the overall needs for business information in internationally operating companies. According to Czinkota and Ronkainen (1994, 236), in spite of the common acceptance of the need for accumulated and disseminated trade information, little knowledge exists about what types of international data are most crucial. Neither the research literature nor the government have presented a hierarchical rank order of data importance, which would help identify the relevance of international information. Secondly, there is no single report, which would put the various dimensions of business information need together with a comprehensive approach, as most of the research done has concentrated in what types of information are needed by international companies. Thirdly, there are no comprehensive academic models of how to identify, measure and analyse the needs for business information in internationally operating companies.

1.3. Purpose of the Study

According to Jain (1994, 333), it is difficult to suggest a general framework for classifying the information needs of all or any particular companies. Every company should work out its own information categories, which may be based on one scheme or another.

Jain's previous view reflects well the main **research problem** of this Thesis:

> ***The analysis of business information needs in an internationally operating company has been determined to be one of the most critical stages when developing a systematic business information management system such as a business intelligence system. There is, however, quite little research done on this specific subject and the academic world is lacking comprehensive models for analysing the business information needs, which could be applied to internationally operating companies.***

The primary **research question** of this Thesis is derived from the research problem:

> ***How should business information needs be analysed in an internationally operating company?***

The primary research question can be divided into **three sub-questions**:

1. What kind of dimensions need to be taken into account when analysing business information needs (chapter 3)?
2. How can business information needs be analysed regarding the various dimensions (chapter 4)?
3. How can the analysis of the various dimensions of business information needs be formulated into one comprehensive and applicable model (chapter 4.8. & 6.1.)?

The **objective** of this study is

> ***to develop a comprehensive model for the analysis of business information needs which can be applied to internationally operating companies in general.***

In order to do this, intermediary objectives are to examine and determine various dimensions of the business information need within internationally operating companies and then study the existing need analysis methods for these dimensions.

This study is intending to contribute on the previous academic discussion by trying to partially fill the research gaps presented in chapter 1.2. Moreover, the developed model is planned to be applied later on in real business conditions as a basis for conducting analysis of business information needs as an integrated part of building management systems for international business information.

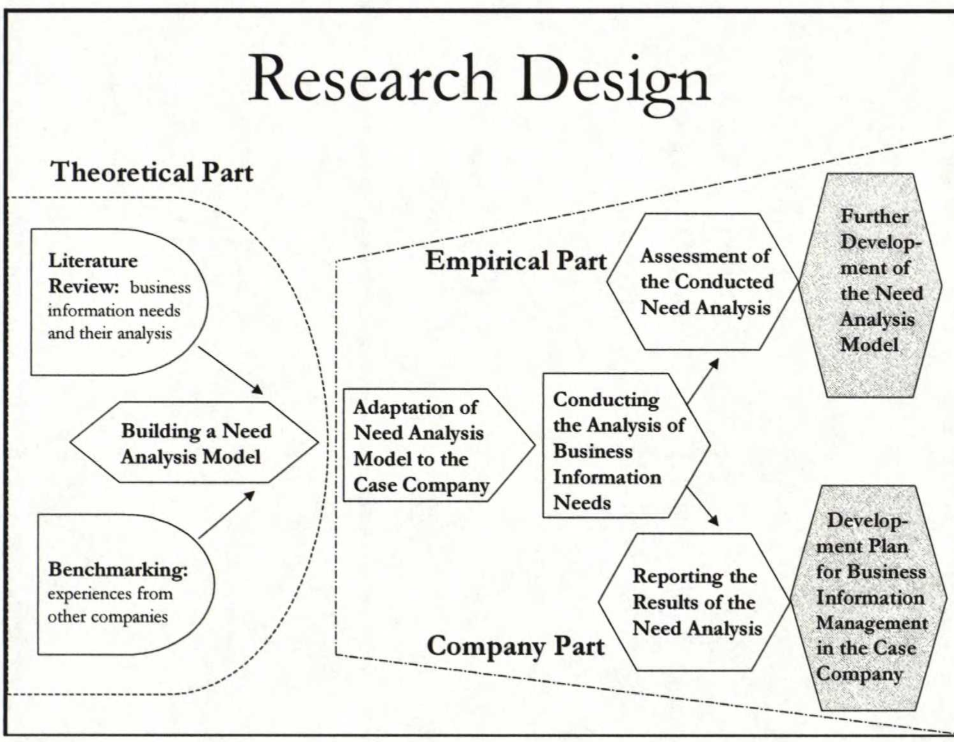
This thesis is part of a larger research project regarding business information management in internationally operating companies. The research project is planned to be completed during the autumn of 1998 with the publication of three separate reports. This Thesis is the second report of the series following Jouko Virtanen's Thesis "From Information to Intelligence - Building a Business Intelligence Programme in an Internationally Operating Company". The series will be further complemented by Antti Vihavainen's study "Business Information Gathering as a Component of Business Intelligence Process".

The interest towards this research area of international business information derives from the authors' previous experiences in this particular field. Furthermore, there is a strong will of combining the previous experience with current research, aiming for future commercialisation of this knowledge by offering competitive and need-based business information solutions for internationally operating companies.

1.4. Structure of the Research and Methodology

The research design, which is presented in the following figure 1, contains three major parts: theoretical part, empirical part and company part. Of these three parts, the first two are directly applicable to this Thesis, whereas the company part involves some work, which will be outside the scope of this paper.

Figure 1. Research Design



The research design for the theoretical part of this Thesis is presented on the left side of the previous figure. In this paper, the theoretical part is divided into three chapters, and is based on existing literature as well as benchmarking experiences from other companies derived from expert interviews and seminars. First of all, the purpose of chapter 2 is to define and explain what international business information is and to highlight the importance of business information for internationally operating companies. Moreover, the current usage of business information in internationally operating companies is examined. Chapter 3, on the other hand, goes through the various dimensions of business information needs such as business information types and forms. Chapter 4 will then concentrate more specifically on examining how to analyse the business information needs in terms of existing models and company experiences. The theory part is concluded in the end of the chapter 4 with the development of a model for analysing business information needs in an internationally operating company, which will also act as the framework for the empirical study.

The research design for the empirical part of the Thesis is presented in the upper-right corner of the previous figure 1, and is further elaborated in chapter 5.1. The methodology for the empirical research is a case-study, in which the developed business information need analysis model is, first of all, adapted to the case company, the Business Group Communication Networks of *NKF Holding N.V.* This adaptation is documented in chapter 5.3. After this, the business information need analysis is conducted in practice according to the adapted model, the primary methods being brainstorming, face-to-face interviews and survey, which include questions of both quantitative and qualitative characteristics aiming to analyse and measure the "real business information needs" in the company. This section is documented in chapters 5.4.-5.6. and the findings are summarised in chapter 5.7.

Finally, chapter 6 presents the outcome of this Thesis, the "Information Cycle Approach" for analysing business information needs as well as summarises and concludes this whole study.

Outside the scope of this Thesis, the results of the business information need analysis are presented to the company. Based on the analysis of the information needs, the company will later on start building a systematic business information management process based on the concept of Business Intelligence.

1.5. Limitations

There are some limitations to this Thesis. First of all, this thesis is limited in examining external business information, i.e. information on the company's external macro and micro environment. Although, internal business information on the company's own operations is not included in this thesis, it should be considered of utmost importance for managers in international company together with external information.

Secondly, as this Thesis is done from the company point of view, it is not directly applicable for analysing the international business information needs of, for example, researchers and public organisations.

Thirdly, even though the study will cover the dimension of business information usage, the processes of strategic, tactical and operative planning and decision making involving use of business information will not be covered in detail.

Finally, even though Business Intelligence and Competitive Intelligence are currently hot issues, this study is not directly linked in any of these new concepts, but tries to give a general overview on the subject being thus applicable in these concepts as well.

1.6. Definitions of Essential Concepts

Business Intelligence is a continuous and systematic process in order to collect, structure, analyse, and communicate market signals in order to improve competitiveness. (Hedin 1997)

Competitive Intelligence is an analytical process that transforms disaggregated competitor, industry, and market data into actionable strategic knowledge about the competitor's capabilities, intentions, performance, and position; and it is the end product, or output, from the process. (Bernhardt 1994, 13)

Data are scattered bits and pieces of knowledge. (Fuld 1995, 24)

Information is a pooling of bits of knowledge (data) and its more meaningful form. (Fuld 1995, 24)

Information Needs can be defined as those either articulated or tacit information requirements that organisational groups or individual participants must have in order to achieve organisational goals or to produce improved performance. (Pirttilä 1997, 47)

Intelligence is value-added information that has already been analysed and thus provides management with implications, assessments and even predictions which directly help it to make decisions (Fuld 1991, 12). Kahaner (1996, 20-21) defines that intelligence is a collection of information pieces that have been filtered, distilled and analysed, and something that can be acted upon.

International Business Information is all the information about company's external operating environment that may be used in international business operations. It may be possessed by external or internal information source in the stages of data, information or knowledge. The concept of international business information covers the concepts of international market information, international marketing information, export information and trade information, but is not limited to them. (Vaarnas et al. 1998, 11)

International Marketing Research is the vehicle through which the firm gathers and processes relevant information on foreign markets and operations. Its purpose is to help the firm improve the quality of its marketing decisions, apply the correct marketing mix and adopt the correct marketing strategies in each of the countries in which it does business. As a management tool, international marketing research can assist the firm reduce its exposure to risk, avoid errors, identify opportunities and match the firm's capabilities with foreign openings. (Bennett 1995, 37-41)

Knowledge is something that enables people to assign a meaning to data i.e. it is possible to generate information out of data with knowledge. (Van der Spek & Spijkervet 1997)

Management Information System (MIS) is an information system that facilitates management control by producing structured, summarised reports on a regular and recurring basis. (Kroenke et al. 1994, 785)

Marketing Intelligence is information about the overall market environment gathered on an ongoing basis. (Bennett 1995, 37-41)

Marketing Information System (MkIS) is a system designed to generate, store, and disseminate an orderly flow of pertinent information to marketing managers. (Hawkins & Tull 1994, 24)

Monitoring Information is information derived from the regular scanning of selected sources. (Hawkins & Tull 1994, 26)

Recurrent Information is information provided on a periodic basis. (Hawkins & Tull 1994, 25)

Requested Information is information developed in response to a specific request by a manager. (Hawkins & Tull 1994, 27)

2. Role of Business Information in Internationally Operating Companies

2.1. Fundamental Characteristics of Business Information

International business information is all possible information about the company's external operating environment that may be used in international business operations. The external operating environment is formed by all components that exist outside the boundaries of the company that has the potential to affect whole or part of the company (Luostarinen 1997). Examples of international business information are information on competitors' and customers' operations in foreign countries as well as information on the international business environment in general. (Vaarnas et al. 1998, 11)

The concept of international business information is not clear and it is strongly overlapping with the concepts of international market information, international marketing information, export information and trade information. In this paper, however, the term international business information is a comprehensive approach to information including all the mentioned concepts but being not limited to them.

International business information may be possessed by external or internal information sources in the stages of data, information or knowledge. Raw data becomes information after it has been given a meaning and develops itself to knowledge when it is given an interpretation. It is essential to note that lot of international business information is possessed as unrecorded knowledge by employees inside the company. (Vaarnas et al. 1998, 11)

International business information can be packaged into various forms. It can be in the form of a single piece of information or as a deeply analysed market research report. In addition, it can be integrated in the company's information system, being in that way directly exploitable in the designed form. (Vaarnas et al. 1998, 11)

Based on the method of information gathering, international business information can be classified into secondary data and primary data. Secondary data are data that were developed for some purpose other than helping to solve the problem at hand. Examples of secondary data are multi-client market reports, statistical publications, catalogues, newspapers, journals, academic research reports, books and newsletters. Primary data, on the other hand, are data that are collected specifically for the pending purpose. For collecting primary data, the researcher can use, for example, postal surveys as well as telephone and personal interviews. (Hawkins & Tull 1994, 80; Markkinatieto-opas 1995, 18-19)

2.2. *Sources of Business Information*

The information sources of an internationally operating company can be divided into internal and external information sources.

According to Hawkins and Tull (1994, 82-85), internal sources of secondary data can be classified into four broad categories: accounting records (e.g. sales invoice, advertising expenditures, salesforce expenditures and data on inventories), salesforce reports, miscellaneous records (e.g. previous marketing research studies, special audits, and reports purchased from outside for prior problems), and internal experts i.e. anyone employed by the firm who has special knowledge related to the question at hand.

According to Hawkins and Tull (1994, 85-100), there are seven general categories of external secondary information: (1) computerised databases, (2) associations, (3) government agencies, (4) syndicated services, (5) directories, (6) other published sources, and (7) external experts.

According to Vaarnas et al. (1998, 38), the external information sources of primary and secondary information can be roughly divided into three categories: (1) the personal contacts of the company's employees including customers, suppliers etc., (2) public information sources including governmental agencies, universities etc., and (3) commercial information sources including market research companies, consultants as well as all other companies that are selling information or knowledge.

2.3. *Importance of Business Information*

In recent years, there has been lot of discussion on the management of future being actually management of information. The accelerating pace of changes in the business environment strongly supports this argument. In order to identify changes in the business environment into opportunities and threats, business information is needed, and, consequently, business information is, first of all, one of the most important resources in planning and decision making (Vaarnas et al. 1998, 20-21). According to Jaworski and Wee (1993), for example, the main benefits of analysed business information (i.e. competitive intelligence) are improved strategic planning, improved decision making, and better product quality, leading ultimately to increased business performance.

Secondly, business information can be considered as an insurance for company's operations. With information the company can hedge itself against operational risks and be able to reduce costs. The more the decision makers know, the more secure is the decision making and the less mistakes are made. Naturally, all risks can not be covered by business information. (Vaarnas et al. 1998, 20-21)

Thirdly, business information can also be seen as a competitive tool. Information is merchandise in which one can invest, and basically the competitors can gather the same information in the same way as well. The more information one gathers the more difficult and expensive it will become. Only the one, who has carefully analysed his real business information needs and knows the most useful information sources, has a competitive edge in business. (Vaarnas et al. 1998, 20-21)

Finally, the knowledge and performance of a company is formed by the knowledge and performance of its employees. Business information, respectively, is one of the key resources in developing the competence of the company's personnel. The role of the company is to increase the competence of its employees by providing them with the needed business information. (Vaarnas et al. 1998, 20-21) For example, *Nokia Mobile Phones* emphasises business information's role as a facilitator of knowledge creation and organisational learning, thus leading first to organisational renewal and, finally, to increased business performance (Nevanlinna 1998).

Reliable and up-to-date business information normally costs lot of money, because especially the organising and analysing of information are time-consuming phases, in spite of modern technology. Basically, the more insurance is wanted, the more the needed information will cost. Nevertheless, well-timed and expedient business information may save lot of money from the company and contribute to making lot of money for the company. (Vaarnas et al. 1998, 20-21)

It should be kept in mind that business information as such is not valuable. It is the use of it that determines its value. According to Hawkins & Tull (1994, 48), information has value only to the extent that it improves decisions. The value of information increases as (1) the cost of a wrong decision increases, (2) our level of knowledge as to the correct decision decreases, and (3) the accuracy of the information the research will provide increases. The principle involved in deciding whether to do more research should be conducted only when the value of information to be obtained is expected to be greater than the cost of obtaining it. The value of information from a research project is generally estimated intuitively by managers, though quantitative methods are available.

Business information is meant for utilisation and resources consumed for it should be seen as investments and not as costs. Sometimes it seems that companies do not understand that it is not worthwhile to procure information, if it is not used. It would be very difficult to imagine a company that buys machinery without putting it into operation, however. (Vaarnas et al. 1998, 20-21)

2.4. Business Information and International Competitiveness

According to Czinkota and Ronkainen (1994, 235-236), information is even more important in the international setting, where entirely new parameters and environments are encountered. For example, Finland's joining into the European Union has increased the significance of business information in all industries. Furthermore, according to Johansson (1972 ref. Phillips et al. 1994, 127-128), in international activities, uncertainty is generally greater and the changes are taking place more rapidly. Consequently, the time-span for planning and decision making has shortened and demand for information increased (Vaarnas et al. 1998, 22).

The continuously intensifying changes in the companies' business environment as well as the rapid development of the information industry demand lot of new skills from today's and especially tomorrow's manager. It can be said that in today's highly competitive environment, the effective use of information is a critical managerial skill requiring a thorough understanding of the types of information available and how this information is created. (Hawkins & Tull 1994, 7)

The international business literature provides frequent examples of the linkage between the importance of international information and international competitiveness in various stages of internationalisation process. Johansson and

Vahlne (1978) suggest that a lack of foreign environmental knowledge about such issues as language and culture is an important obstacle to the internationalisation of the firm, in general. Another general research analysing international market failures ex post facto found that most errors could have been avoided if the firm and its managers had obtained adequate information about the business environment (Ricks 1983).

According to Bennett (1995, 37-41), international marketing research is necessary in order to decide which foreign markets to enter and the best mode of entry (exporting, licensing, joint ventures etc.) to each nation. Failure to undertake international marketing research might result in higher selling and distribution costs, lost opportunities and the company entering the wrong markets.

Regarding the success of export activities, Kedia and Chahokar (1986) believe that lack of needed information is the major deterrent for the entry of small and medium-sized firms into the export market. Czinkota and Ricks (1981), on the other hand, report that exporters believe increased market information gathering and information on business practices are key variables in improving their foreign trade performance.

Czinkota and Ronkainen (1990), in turn, state that exclusive information can be a key motivation in providing the firm with strategic competitive advantage and international marketing success. The overall point and urgency is perhaps summarised best by Farmer (1987, 113), who states that "to be world class one needs world class information".

Some research has also been done in Finland regarding the linkage between business information and international competitiveness. According to Härkki et al. (1995, 138-141), employees' insufficient knowledge of foreign markets was ranked third in a research on factors that hinder exports of Finnish small and medium sized metal companies. Altogether 8.1 percent of the surveyed companies indicated this factor as the primary hindrance for exporting. Only insufficient human resources (11.8%) and competitiveness of local manufacturers in terms of established customer relations (11.8%) were ranked higher.

According to a study done by Finnish Foreign Trade Association and reported by Kauppalehti (1996), lack of knowledge and experience on international markets are the main hindrances for Finnish SME-companies when planning to start export operations.

The differences in domestic and international marketing are decreasing along with globalisation due to increasing similarities in consumption and due to the easing of communication. For example, according to Phillips et al. (1994, 20-21), the differences between international and domestic marketing are becoming much less acute. Regarding international business information, the global environment is, however, even more unreliable and unpredictable. As the trends in various countries become more alike and as their interrelations increase, one has to take various new things into account when considering the situation in one target market. For example, speculation with a single country's currency can lead into many economies collapsing in the neighbourhood. Furthermore, the increasing global competition has a significant effect on the importance of international business information. (Vaarnas et al. 1998, 22)

2.5. Current Usage of Business Information in Internationally Operating Companies

Although the importance of business information in international operations is well recognised in research, the real situation in international companies is totally different. According to a study done by the UK-based business information company Reuters (1997, 5), almost half of the managers believe that the cost of collecting information exceeds its value to business, and 47 percent believe it distracts them from their real job responsibilities. Some companies have indeed made the mistake that they are emphasising the amount of information instead of the quality of information. This may have led to information overflow and to frustration, and consequently to a lower appreciation of information.

According to a study done by Walters (1996) on Norwegian international companies, neither the number of years of export activity nor the total value of exports are associated with the extent of foreign data acquisition undertaken in the survey firms. However, more committed exporters, as measured by the relative share of export sales and export orientation, do undertake more extensive research activity in overseas market.

According to Goodman (1993), research has found that managers frequently plan, solve problems and make decisions based upon incomplete and sometimes inaccurate information. At worst, this may result in dire consequences for their organisation. At best, this can cause less than optimal decisions to be made, placing the organisation in a less effective and competitive position than it would otherwise be.

Also Czinkota et al. (1992, 331) have found similar characteristics in the information use of managers and claim that decisions concerning entry and expansion in overseas markets and selection and appointment of distributors are made after a cursory, subjective assessment of the situation. The research done is less rigorous, less formal, and less quantitative than for domestic activities. Furthermore, once a firm has entered a foreign market, it is likely to discontinue researching that market. Many business executives appear to view foreign research as relatively unimportant.

A major reason why managers are reluctant to engage in international research is their lack of sensitivity to differences in culture, consumer tastes, and market demands. A second reason is limited appreciation for the different environments abroad, while the third reason is lack of familiarity with national and international data sources and inability to use international data once they are obtained. Finally, firms often build up their international business activities gradually, based on unsolicited orders. (Czinkota et al. 1992, 331)

Goodman (1993) goes through the reasons for ineffective use of information in more detail and presents four influential factors: (1) managers may make incorrect assumptions about or lack knowledge of, available information, (2) managers may lack the comfort, ability or inclination to access critical information because of chain of command or networking issues, (3) staff may be unequipped to adequately interpret existing information, (4) critical internal and external information and the ability to access it may be absent.

The somewhat low appreciation of business information, is partly due to the fact that it is so difficult to evaluate the value of the information. In most cases it is impossible to calculate return-on-investment for information as it can be very rarely linked with direct sales. On the other hand, it is also impossible to measure the losses which have resulted due to lack of information. (Vaarnas et al. 1998, 20-21)

Considering the high costs of international marketing research and the uncertainties involved it is not surprising that some companies choose not to commit this expensive activity, relying instead on intuitive judgements and close observation of the activities of local competing businesses. The company should note, however, that bad decisions resulting from the analysis and interpretation of faulty research data will actually reduce company profitability. (Bennett 1995, 44-45)

One major issue is that unfortunately many companies use only information regarding their own activities, i.e. internal operating environment, in their decision making, whereas the role of information on the external environment is marginal. Furthermore, the collection of information on the internal environment is usually much more systematic than the collection of information on the external environment. Nevertheless, majority of the business opportunities and threats are formed by external factors. (Vaarnas et al. 1998, 20-21)

By combining the information on both the internal and external operating environment, the company is able to position itself in respect to the other companies in the field. Harnessing both the information on internal and external environment for the benefit of the company is one of the most challenging duties of the company management. (Vaarnas et al. 1998, 20-21)

3. Needs for Business Information in an Internationally Operating Company

3.1. Differences in the Needs for Business Information in International and Domestic Operations

According to Gorton and Doole (1989, 41), when a company decides to market its products on an international scale, the importance of carrying out effective marketing research takes on a new dimension. The international environment in which an exporting company operates is much larger, more uncertain and more vulnerable to factors totally beyond the control of the company. The company needs to know its strengths and weaknesses, and needs a clear and accurate analysis of the opportunities and threats prevailing in the international marketplace.

When the company expands its operations into international markets, the need for business information increases considerably. According to Vaarnas et al. (1998, 22-23), there are four main factors to this increase. First of all, there are many new types of information of which information is needed such as information on foreign trade regulations, international shipments and foreign currencies. Secondly, when going into international markets, the information needs include also elements that are self-explanatory in the domestic market such as cultural issues and general country information. Thirdly, the information needs in international markets are more in-depth and more comprehensive compared to the needs in the domestic market. For example, competition may have to be assessed again, as there may be substitute products that are not available in the domestic market. Finally, in general, the need for international business information renews more rapidly than the need for domestic business information. This is especially true, when we have a western company point of view as the less developed markets are generally much more turbulent (Bennett 1995, 15).

3.2. Dimensions of the Need for Business Information

When needs for business information in an internationally operating company are discussed, the most typical and profound dimension is related to what kind of information is needed, i.e. the information content. In addition to the information content, there are, however, many other dimensions related to a company's or individual's business information needs. For example, according to Gragg (1998), information is effective when it is the right kind, in right structure, in right place, and received at the right time. Similarly, Bernhardt (1994, 19) has stated that managers do not need yet more lorry loads of facts or information, they need an analytical intelligence product, delivered on time, and in a format that can be easily and quickly assimilated.

The following list of the various dimensions of information need has been combined from the views presented by Ala-Pietilä (1986), Bernhardt (1994, 19), Königer & Kjanowitz (1995), Heath (1996), Salo (1997), Kennedy et al. (1997), Gragg (1998), and Vaarnas et al. (1998, 26-36). Most of the dimensions in the list will be dealt with more detail in the following chapters 3.3.-3.11.

Dimensions of the Need for Business Information:

1. The needs depend on the information user, which can be the company on the whole or any of its business divisions, business areas, subsidiaries, units, functions, departments, processes, teams, or individual employees.

2. The needs depend on the information user's purpose for using the information.

3. The needs vary in terms of information content
   - Existence and intensity of the needs for various types of information
   - Existence and intensity of the needs by geographic regions
   - Quality-characteristics of needed information

4. The needs vary regarding the form of information
   - Needs for information structuring
   - Needs for conciseness and extent of information e.g. length of reporting
   - Needs for degree of analysis

5. The needs vary regarding the preferred methods of information dissemination and storage
   - Needs for pushed information vs. pulled information
   - Needs for the dissemination method of information (electronic vs. hard copy, written vs. oral vs. multimedia)
   - Needs for the storage/availability of information

6. The needs vary regarding the preferred information dissemination time in terms of urgency and frequency
   - Needs in terms of urgency
   - Needs in terms of frequency

7. Needs evolve gradually in the course of developing international operations

3.3. Users of Business Information in an Internationally Operating Company

The company's business information needs depend on the characteristics of the company's business and the degree of international operations (Ala-Pietilä 1986, 3). Similarly, the business information needs of individual employees within the company, depend on the employee's specific area of responsibility and change along with the development of the business environment. Consequently, the need for business information is first of all dependent on who the information user is, and secondly, on the use purpose of the information.

It has to be remembered that only a small part of the organisation's information needs stem from the top management and thus information needs exist on other levels as well (Fuld 1991, 15). For example, Tuula Salo (1997) from *Merita Bank*, has identified that needs for business information within *Merita Bank* exist in the group level, company level, business area level, team level and individual level.

For the purpose of this paper, the users of business information in an internationally operating company are categorised as **organisational users**, when the user is defined as the whole company or as any of its business divisions, business areas, subsidiaries, units, functions, departments, business processes or teams, and **individual users**, when the user is a single person e.g. an export manager or a product developer.

3.3.1. Organisational Users' Needs for Business Information

The larger the organisation, the more separate entities can be considered users of business information with different kinds of needs. The group level in which the directors are mainly responsible for strategic decisions is normally the most important target for a management information system or a business intelligence program. The group is often divided into separated strategic business divisions, business areas (SBAs) and business units (SBUs). Moreover, there are foreign subsidiaries within the group and specialised functions such as R&D, marketing and production.

A common denominator for all these units within the company is that they are operating in specific areas of the same general business environment. Actually, that has normally been the basis for their categorisation as separated entities. Due to the same business environment, there are lots of similarities in the business information needs of these entities. However, due to the specialisation even within one department, business process or team, there are various, specific needs for business information.

According to Simpson & Prusak (1995), information merely exists to serve the needs of a function, or, reflecting more recent thinking, the needs of a business process such as customer service process, logistics process or R & D process. For example, *Nokia Mobile Phones* (Nevanlinna 1998) and *Outokumpu Copper Products* (Pesonen 1998) have built their company's business intelligence system around the information needs of key business processes within the company.

The more the company is involved in international business, the larger is the number of activities in the company that need international business information (Vaarnas et al. 1998, 26). For example, *Merita Bank* has defined the user groups of information services to be the top management, marketing department, business planning department and R & D department (Salo 1997).

Regarding the various functions, departments or business processes within a company, the need for international business information is most frequently related to marketing. According to Calof (1997), in **marketing** activity business information in the form of intelligence can be used to track down new product rumours, identify why the company has won or lost contracts, assess competitors' positions, identify whether competitors are changing the rules of the game, or examine potential new market rivals.

According to Vaarnas et al. (1998, 26), the information need is with no doubt the most visible in marketing, but in practice, it is important for all information users in the organisation to obtain such information that reflects external changes in their area of responsibility. It is extremely important, for example, for the company's **R & D** activity to obtain information on the general technological development, proceedings of competitors and changes in customer preferences. When various industries are considered, the technology development is especially important for the R & D activity in telecommunications companies, whereas changes in customer preferences are extremely important for textile and foodstuff industries. (Vaarnas et al. 1998, 26)

In **manufacturing and production**, business information is useful for assessing the company's relative cost competitiveness. If the competitors of the company have operations or processes that are superior to the company's, it should determine how it makes the product, the extent of its automation, what kinds of quality-control programs exist and how its production people are managed. (Calof 1997)

Regarding **human resources**, business information can help the company to assess whether its policies are in line with the competitors' policies; determine why some firms are more productive or creative or why they are the first to market exciting new products; evaluate all elements of compensation including benefits, salary, options, advancement opportunities, support services and training; identify how to make the firm more competitive; and assess potential changes in industry regulations. (Calof 1997)

The **accounting and controlling** activity in an international company needs international finance and credit information, whereas the **purchase** activity needs information on appropriate foreign suppliers. Moreover, business information can be valuable in **logistics** and especially in **business development**. (Vaarnas et al. 1998, 26)

3.3.2. Individual User's Needs for Business Information

In business information literature, individual business information users are in most cases referred as "managers". Pirttilä (1997) has a somewhat broader view with the categorisation of business information users to managers, middle managers, and experts. According to a study made by Vaarnas et al. (1997), where company representatives responded openly to who are the information users in the company, the responses were much more diversified. In the study, general managers were mentioned most frequently as users of international business information followed by export directors and managers, marketing directors and managers, R & D directors, production directors, purchase directors and financial directors. In some interviewed companies, however, also product developers, research engineers, export secretaries, executive assistants as well as market researchers, business analysts and people working in information service department were mentioned. Consequently, based on this study, the definition of business information users should not be limited to managers, even though it is definitely the most important user group.

According to Pirttilä (1997), managers, middle managers and experts need different types of information. Gofton and Ness (1997, 11), on the other hand, present that the same data may be used by different managers in slightly different ways, with each one concentrating on a slightly different aspect. Planners may want less detail in recurrent information than operational controllers, for example.

Top management's need for information must always be considered in relation to the rapid changes of business conditions and changes within the business environment. Experiences and knowledge about how managers use information show that the higher up in the management hierarchy, the more information is needed about external business relations. (Bjoernstad & Kalseth 1994, 78)

Top management typically needs more concentrated and more aggregated information than the middle managers and experts. One interesting feature is also that top managers tend to need more information from external sources than the middle managers and experts. (Pirttilä 1997)

According to Ylihärsilä (1991, 17), the personal information needs of each director are different on the top management level. These depend on the organisational structure of the firm as well as the directors' personality, managerial style, personal characteristics and priorities.

Ylihärsilä (1991, 18 ref. Scott 1986) categorises managers into four different types based on the different information requirements. First, intuitive managers who use aggregate information to outline big entireties require only little information to make decisions. Second, on the other end there are the systematic managers who use detailed information. These kinds of managers require a lot of information to support their decision making. Third, systematic managers that aim to understand larger entireties require summary-type of aggregate information to make decisions. Fourth, the function of information for intuitive managers who use detailed information is a confirmative one as these managers use the information to confirm their own instincts.

Berkley and Gupta (1995) have studied information needs in service marketing and state that "whereas executive managers are concerned with setting broad policies and goals for the organisation, the **service-delivery personnel** are concerned with the execution of tasks. They require information that is generally well defined, narrow in scope and arising largely from sources within the organisation. The information requirements for service managers fall between the extremes of executive management and service delivery personnel."

Moreover, according to Pirttilä (1997), it is quite often the responsibility of the **middle managers** to contract, aggregate and communicate information vertically to the managers and horizontally between different groups.

3.4. Use Purposes of Business Information in an International Company

According to Pirttilä (1997), the use purposes of competitor information include: (1) strategic and operative decision making, (2) source of ideas and innovations, (3) legitimisation of proposals and own activities and persuading others to support them, (4) benchmarking to compare the company to its competitors, (5) motivating personnel and making them aware of the business environment, (6) developing company image, and (7) media of power. Vaarnas et al. (1998, 26-28) have adopted some elements of Pirttilä's list to the use of business information on the whole and categorised the uses of business information into: (1) planning and decision making, (2) identification of opportunities and threats from the external environment, (3) follow-up of own activities, and (4) developing the knowledge of the company and the company's personnel.

The most visible and highlighted purpose of business information is its use in **planning and decision making**. According to Hawkins & Tull (1994, 12) it is important to recognise that managers use information as they make decisions. The information may come from marketing research or it may come from intuition and experience. No matter the source, the manager needs to determine the information required and to decide how he or she will use it to reach a decision.

Planning and decision making is necessary in strategic as well as in tactical and operational levels (Gragg 1998). Similarly, business information is a resource in all these three levels. In strategic planning the time horizon and consequent information need is long-term, whereas in operational planning and control the planning horizon is short term. Moreover, tactical planning ranks in the between. Similarly, regarding decision making, strategic decisions can be categorised as unstructured and operational decisions as more structured. (Robson 1997, 85)

In **strategic level**, business information helps to make good long run decisions serving as a warning system and revealing opportunities. Business information is one of the crucial elements when starting the first international operation as well as during the whole internationalisation process. Strategic planning and decision making can not take place in a vacuum. They have to be supported by various kinds of analyses, research reports and pieces of information. (Markkinatieto-opas 1995, 20-21; Vaarnas et al. 1998, 26-28)

According to Herring (1992), a strategy cannot be better than the information from which it is derived. The more comprehensive and prescient that information, the more likely the strategy is to be successful. Two basic categories of information are required for strategy formulation: (1) information about the company's own resources and capabilities and (2) relevant information about the company's total external environment, including customers, competitors, the industry structure, and various competitive forces that shape the markets in which the company competes. The completeness and accuracy of the two sets of information vary considerably. It is this latter set of information that is generally defined as competitive or business information or today very often as intelligence.

In marketing implementation stage where marketing **tactics** are created, information's role is guiding. Information helps to implement marketing decisions regarding, for example, the promotional message used, usability of different media and to the evaluation of different distribution channels. (Honni et al. 1984, 145-147)

Business information is also crucial in **operative** planning and decision making. Operationally business information supports the daily operations and can help the firm change its strategies from reactive to proactive. Choosing a new importer, giving credit to a foreign customer and planning international shipments are all situations that need to be backed up by suitable information. (Markkinatieto-opas 1994, 20-21; Vaarnas et al. 1998, 26-28)

The use of business information in decision making has been with no doubt the most traditional purpose of business information, and is still the dominant purpose especially in small internationally operating companies in which the resources are scarce. Typically these situations are occasional and information is collected for the specific purpose and not in a systematic way. (Vaarnas et al. 1998, 26-28)

As the turbulence of business environment is gradually increasing, the time-span for planning and decision making has shortened. Especially in large internationally operating companies, the need for business information is not occasional but rather continuous both in terms of monitoring the company's own operations and the external environment. The **monitoring of company's own operations** has extended itself to include also external information sources such as market research companies, newspapers and consultants. Consequently, the company can be benchmarked better with its competitors and the company image can be reviewed in a more objective way. (Vaarnas et al. 1998, 26-28)

The **identification of opportunities and threats** is done by monitoring the external operating environment. This can be done on a global scope as well as on a country-by-country basis. As formerly information was collected for decision making, now information can act as an impulse for creating a new planning and decision making situation. (Vaarnas et al. 1998, 26-28)

In addition to planning and decision making, the information that is collected from the external environment can be used for **developing the knowledge of the company and its personnel**. As the companies internationalise, it is of utmost importance to invest in the international knowledge of the personnel. When employees are sent on expatriate missions it is extremely important to give them the necessary information on the target market. Moreover it is important to organise training, for example, for the export assistants regarding changes in trade regulations and necessary shipment documents in new export countries. (Vaarnas et al. 1998, 26-28)

When Vaarnas et al. (1997, 22) studied the use purposes of international business information in Finnish companies as an open question, the answers were differentiated into three groupings: 1) information as a general success factor of the company, 2) information as a resource for the company, for example, in planning and decision making as well as external monitoring, and 3) use of information in the functions of the company such as marketing, R&D etc. As the same issue was surveyed by a formulated question, the alternative "monitoring the development of foreign markets" had the highest score $^{(4.43/5)}$ on average followed by "monitoring the competitors" $^{(3.97/5)}$, "monitoring the customers" $^{(3.93/5)}$, "strategic decision making" $^{(3.89/5)}$, and "operative decision making" $^{(3.86/5)}$. The alternatives "monitoring the external business environment" $^{(3.41/5)}$, "monitoring own activities" $^{(3.30/5)}$, and "developing the competence of own personnel" $^{(2.96/5)}$ were ranked considerably lower.

3.5. Needs for Specific Types of Business Information

3.5.1. What Types of Business Information Are Needed?

There is an almost unlimited scope of the types of business information that companies need in their international operations and they depend very much on the company and its line of business. Some of the information types are, however, crucial to most of the internationally operating companies, and these information types have been discussed to a considerable extent in previous literature.

According to Czinkota and Ronkainen (1994, 235), business executives, policy makers, and researchers alike need to know about the economic environment, the technological level, and the cultural and social dimensions of foreign countries. It is also important to understand foreign political systems, determine their stability, comprehend pertinent legal issues, and identify differences in social structures. International information is extremely important for policy makers to set good policy, and negotiation goals, for business executives to be successful in the global market, and for researchers to obtain in-depth insights.

In their seminal book on international marketing research, Douglas and Craig (1983) suggest that macrodata help companies select countries or markets that merit in-depth investigation, make an initial estimate of demand potential in a given country, or monitor environmental change. Cavusgil (1984) proposes the usefulness of macro-level information on industry in foreign markets, broad economic and demographic variables, political indicators, and cultural indicators.

Walters (1983) finds that useful background knowledge is provided by information on export and import shipments, trade barriers, and data on overseas markets. An analysis by Wood and Goolsby (1987) reports that key information should consist of knowledge about market potential, trade restrictions (tariff and non-tariff barriers and transportation barriers), politics and their effects on trade, and economic and legal factors.

According to Bennett (1995, 39-41), information is needed on the environmental conditions prevailing within relevant countries, on variables affecting specific market decisions (choice of advertising media, pricing, selection of distribution channel etc.) and on trends in various markets (tastes and fashions, demographic change etc.).

In the study of Palvia et al. (1996) where information requirements for an executive information system were examined, market information about other countries received the highest priority. This information is vital to an international business, as it provides knowledge about product demand, existing products, and consumer taste. The next priority information is about competitors, their capabilities and strategies. Regarding the need for information on competitors, Gordon (1982) has presented that the need for information on competition is wider than many companies think. One should include companies which make substitute products and companies (perhaps even entire emerging industries) which may soon enter the company's market.

In addition to the existence of a need for a specific type of business information, another dimension is also the intensity of the need i.e. how critically the specific type of information is needed. This intensity of the business information need has been studied in the USA by Czinkota and Ronkainen (1994, 235-244), whose study revealed that industry representatives considered information on "US imports/exports", as well as information on "tariffs" and "non-tariff measures" as the most important types of information from the list of 28 information types. In a study done by Vaarnas et al. (1997, 31-35) on the information needs of internationally operating Finnish companies, "competition in the market", "supply in the market" and "customer information" were regarded as the most important types of information from the list of 23 information types.

3.5.2. Categorisation of the Types of Business Information

As it was discussed in the previous chapter, there is a large number of different types of business information that are needed in international operations. These types of information have been categorised very variably in previous research, which is quite understandable, as the categorisation depends on the specific needs of the organisation or the person in question.

One of the roughest divisions is to divide the types of business information into information on macro environment and micro environment of the company. Ala-Pietilä (1986, 35-36) categorises the information needs of an international company first into information on external information and internal information. The internal information is then further divided into "resources" category and "performance" category, whereas the information on external information is divided into information on macroenvironment and microenvironment. Furthermore, macroenvironment is further divided according to the PEST-division i.e. information on political, economical, social and technological environment. Microenvironment, on the other hand, is divided into information on demand, customer needs and competition.

According to Luostarinen (1997), macro environment includes such types of information as the political, socio-cultural, economic-technical and legal environment, whereas micro environment includes those parts of the external environment which are relevant to the organisation's strategic domain such as competitors, suppliers, customers, regulatory agencies etc. The view of Czinkota and Ronkainen (1994, 236) is very similar as they suggest that macro information provides mostly knowledge about different environments, whereas micro information provides details about markets, activities within those markets, and the changes taking place in them.

The categorisation to macro and micro information is quite justified, but thinking about the specific information needs of the companies this categorisation is often too general and not sophisticated enough.

Honni et al. (1984, 148) propose that the information types that are needed in marketing can be categorised into: (1) information concerning the product group (market shares of different brands and producers, consumer expectations and opinions, retailer expectations and opinions), (2) information concerning the specific industry (structure of the industry, activities of competitors, distributors and product suppliers), and (3) information concerning the society (demographic changes, economic changes, technological changes, political and legal changes, social and cultural changes).

This categorisation is suitable for marketing purposes but thinking about the overall business information needs of an internationally operating company, the scope becomes too narrow and does not reflect well the international operating environment.

Trying to take into account the evolving information needs along the development of the company's international operations, Vaarnas et al. (1998, 11-12) have categorised the types of international business information into four groups: general country information, industry specific information, marketing-related information and investment-related information. This categorisation is quite suitable when information needs are analysed on a case-by-case basis i.e. when one single international market research is planned. It does not, however, work well with respect to the overall needs for specific business information types in an internationally operating company.

Another typical categorisation, used especially by business intelligence specialists, is to divide the types of international business information in three groups: competitor information, customer information and market information. A further extension to this method, is to divide the group of market information into smaller components such as industry/product information and country information. (Virtanen 1998, 30-34)

The previous categorisation seems to be well applicable for the use of analysing the business information needs. The only major deficiency is the lack of a category for the company's partners and suppliers. Consequently, for the purpose of this Thesis the categories of competitor information and customer information presented by Virtanen (1998, 30-34) are merged together with partner information and supplier information to form a category of company information. Consequently, the types of business information in this Thesis are categorised into three major categories presented in the following list.

Categorisation of Specific Types of Business Information (Framework):

- **Company Information:** e.g. competitors, customers, partners and suppliers

- **Industry/Product Specific Information:** e.g. general trends, supply, demand and project

- **Market-Area Specific Information:** e.g. business environment (PEST), marketing information and investment information

3.6. Needs for Business Information in Different Geographical Market Areas

According to Czinkota et al. (1992, 406), differences between markets exist in three dimensions: physical, psychic, and economic. Physical distance is the geographic distance between home and target countries; its impact has decreased as a result of recent technological developments. Psychic, or cultural, distance refers to differences in language, tradition, and customs between the two countries. Economic distance is created by differences in the economic environments of the host country and the target market. Generally, the greater the overall distance – or difference – between the two countries, the less knowledge the marketer has about the target market. The amount of information that is available varies dramatically. For example, although the marketer can easily learn about the economic environment from secondary sources, invaluable interpretive information may not be available until the firm actually operates in the market.

The study done by Vaarnas et al. (1997, 27-30) on the information needs of internationally operating Finnish companies revealed lots of interesting things on the **existence of geographical information needs** of the companies. First of all, two thirds of the surveyed Finnish companies needed information on Western Europe (EU) and Russia, whereas approximately half of the companies needed information on Baltic States, Scandinavia and Asia, and another one third needed information on Northern America and Eastern Europe. The number of companies needing information on Latin America, Middle-East, Africa or the Oceanic was much smaller.

Generally, the information needs were strongly dependent on the current international operations of the company. This was indicated by the correlation between the current geographical target markets and the information need on various geographical markets, which was on the same level for EU, Scandinavia, Russia and the Baltic States. It was, however, very interesting to note that even though only one company was operating actively in Eastern Europe, altogether ten companies needed information on the area. In addition, Asia was also an area where the expression of information need was more frequent than its identification as a geographical target market. When taking into account the expansion of Finnish companies to the Eastern Europe and Asia, it can be concluded that the existence of information needs on various geographical market areas depend not only on the current operations, but also on the planned future international operations of the company. In other words, the existence of information need on a geographical market area evolves before the actual expansion of international operations. (Vaarnas et al. 1997, 27-30)

In addition to the existence of an information need on a specific market area, the need can also be measured in terms of **intensity**. In the study of Vaarnas et al. (1997, 27-30), the intensity of geographical information need followed strongly the results of the existence of a geographical information need, as the importance of getting information on EU and Russia were highlighted.

The nature of management decisions does not vary from country to country, but the environment differs from country to country. For this reason, the **types of information required** may vary from one country to another. (Jain 1994, 315) One factor that is strongly affecting to this is the development stage of the market. In the markets that are developing very strongly, the information need is naturally very turbulent due to the turbulent market environment. Especially the follow-up of the economic and political situation are key issues in these markets. Moreover, the analyst needs to take a different view of some indicators. For example, to find out real purchasing power one can not only rely on average income figures but has to take into account the uneven distribution of income as well. (Vaarnas et al. 1998, 36)

3.7. Needs Regarding Quality Characteristics of Business Information

Information quality is closely related to the value of information. According to Bjoernstad and Kalseth (1994, 79), the following factors will eventually be decisive when evaluating the quality of information: relevance, reliability, validity, meaning over time, completeness, accuracy, and timeliness. Vaarnas et al. (1997, 12) have extended this list with uniqueness and essentiality. Some other authors have used other kinds of adjectives but the basic ideas are the same.

Robson (1997, 87 ref. Gorry & Scott-Morton 1971) has made a comparison of the information requirements on the strategic, the tactical and the operational level. Even though her analysis is not focusing only on the quality characteristics of business information, there are many interesting findings presented in the following figure 2, which are worth discussing in this context. Some of the characteristics in the following list are discussed in more detail in the following chapters.

Figure 2. Model of Information Requirements by Level of Management Activity

Characteristics of Information	Operational Tactical Strategic
Source	Largely internal --------------------------- External
Scope	Well-defined, narrow -------------------- Very wide
Level of Aggregation	Detailed ----------------------------------- Aggregate
Time Horizon	Historical ------------------------------------- Future
Currency	Highly current ---------------------------- Quite old
Required Accuracy	High --- Quite low
Frequency of Use	Very frequent ---------------------------- Infrequent

Source: Adapted from Gorry & Scott-Morton (1971) ref. Robson (1997, 87)

According to Robson (1997, 87 ref. Gorry & Scott-Morton 1971), the information requirements of the different levels of management are different because the management activities themselves are different. The requirements of the strategic and the operational level differ the most while the requirements of the tactical level are somewhere in between these two. The information requirements of strategic management can be shortly characterised as being concentrated on aggregate information from largely external sources. The scope of information is very wide, time horizon targeted at future, required accuracy low and use infrequent. The information needs in the operational level are basically in the other end of these categories. Of the characteristics presented in the figure 2, especially "scope", "time horizon", "currency" as well as "required accuracy" are strongly related with the quality characteristics of information.

One important thing which should be taken into account is that one should not always pursue for the best possible quality of information. Both Tyson (1997, 199-200) and Wilson (1997, 43) have reported that all too often, organisations seek to make their working reports completely accurate. Apart from being impossibly elusive, perfect accuracy is expensive and unnecessary. Tremendous accuracy is rarely required if one is using information to make decisions. There is, for example, no sense in evaluating the company's market share in the accuracy of five digits. When the decision is made, the information is already old to some extent and a rough estimate would serve the purpose as well with considerably less effort. Even worse problems are caused by chasing spurious accuracy, in that the information becomes too late to be useful to support management decisions. The accuracy of the information should only be made good enough for its purpose and no more. Overall, it is more feasible to concentrate on perspective, not precision. (Tyson 1997, 199-200; Wilson 1997, 43)

Another extension to the previously mentioned dilemma of pursuing for best possible quality of information is illustrated by the fact that very often managers appreciate gossip information. Even though its quality is generally low, it can prove to be very valuable. According to Bjoernstad & Kalseth (1994, 78), business managers need key information about business results and performances, its relative position compared to named competitors, and so called "signal (soft) information" about general or specific changes and movements in the market place. The term "signal information" here refers to unauthorised information that is exchanged within a network comprising suppliers, competitors, customers, analysts and other players in the field. Typical characteristics of signal information is that as a rule it stays unprocessed, that it is exchanged within a closed, intimate network of people who trust each other, and that it remains "private" information. News information picked up at seminars and conferences when talking to speakers, fellow participants or exhibitors, are typical examples of such "private" information.

3.8. Needs Regarding the Form of Business Information

In one of his consulting works, Fuld (1991) acknowledged that the company's senior management complained that it received many detailed memos with no analysis. The notes were far too lengthy to read and came to no conclusion. Management knew at times that it was missing important information.

Moreover, according to Rosén (1996, 53), information technology gives us the means to handle an ever growing flow of information, but equally important to an optimal use of IT, is that we recognise the fact that our brains' information processing ability is limited and that we must therefore approach any information handling activity with a strong sense of economy.

Both of the previous views indicate that it is not only the content of the information which sets the value of the information, but the form of the information has a great effect on this as well. Consequently, there are specific needs affecting the processing of business information including the needed structure, extent and conciseness, and needed degree of analysis of information. These factors are worth discussing in more detail in the following paragraphs.

According to Vaarnas et.al. (1998, 103-104), the raw information ought to be structured in a form, electronic or not, that enables further processing and utilisation. Königer & Kjanowitz (1995) present four dimensions when **structuring** information: selection (clarity about the type of information), time (information life-cycle), hierarchy (establishing order in terms of detail so that the prospective user of an information source will immediately profit) and sequence (sequential ordering principle that follows hierarchy). If information is structured well, each of these elements is consistent throughout the medium. Especially the selection part is important, because in spite of a need determination, it is highly possible that also irrelevant information is gathered. Thus, there has to be a phase selecting only the needed information.

According to Wilson (1997, 37), if the reports are **concise** and their **extent** is set correctly, they will be more easily understood and therefore used to support decisions and management action. On the other hand, if there is too much data, then the information contained therein will not be appreciated by the reader – if they even bother to try.

Reports and other forms of information presentation are not designed by the users, but by other managers and technicians. So often the content is another person's view of the reader's needs and is often inaccurate, incomplete or more than is required. It is important that information intended for management use should be concise and to the point so that the message is not buried in spurious detail. (Wilson 1997, 42)

As it was mentioned earlier, corporate executives are demanding products that analyse and synthesise data and textual information (Stanat 1990, 12-15). Prescott and Smith (1989) divide the **degree of analysis** in three categories. Firstly, no analysis is involved if the information collected is similar to the information stored. Moreover, basic analysis level implies to information that has been processed to some extent making e.g. trend analysis. Finally, the highest level of analysis requires drawing implications concerning the particular situation the company is facing.

In addition to the needed degree of analysis, it is important to take into account the human aspect of information analysis, i.e. the question of who will analyse the information. According to Kamppinen's (1996, 74) study done in *Vaisala*'s surface weather division, almost all information users preferred to have the raw data flow to analyse themselves, rather than to receive analyses made by someone else. This is very strongly against the idea of business intelligence functions where the analysis is to a large extent done centrally.

These needs regarding the form of business information, can be satisfied by developing suitable information products based on the specific needs of the company. For example, Vaarnas et al. (1998, 14-19) have categorised the business information products into six different groups: (1) small-scale case-by-case data checks, (2) published reports, (3) ad-hoc market surveys, (4) continuous monitoring information (market intelligence), (5) periodical follow-up research, and (6) market information in computerised information systems. These information products are utilised at least partly in most of the internationally operating companies

Also Bernhardt (1994) has defined information products that the information users need. The special intelligence briefing reports represent the highest level of strategic value for decision-makers dealing only with one or few specified strategic issues. Periodic information briefings are also of relatively high strategic significance, but they are distributed on a regular basis dealing with common strategic issues. The lower level reports obviously represent less strategic content. The idea is to present a picture of a certain situation (situation analysis). Strategic impact worksheets simply provide a compact list of items identified and their possible strategic effect. Competitor profiles aim at producing knowledge of competitors in general and their actions.

3.9. *Needs Regarding the Dissemination and Storage of Information*

Concerning the method of making information actionable, Kahaner (1996) points out that a user perspective needs to be employed. In addition to including the right substance components, the information products should also be available by the method that will have the biggest effect on the management. This can be done based on push-techniques, related especially with dissemination of information, or pull-techniques, related especially with storage of information.

The two main ways of disseminating analysed information are argued to include written reports and oral presentations. Typically, combinations are used as well. Written reports can be disseminated in a hard-copy format by paper or in electronic format by email or Intranet, for example. It is, however, argued that for most managers, an oral presentation works best as it provides a platform for immediate feedback (Ghoshal&Westney, 1991). Many times structured information becomes too aggregated leading to too general information. Nevertheless, the main implication for the information presenters is to be aware of the users' preferences regarding the receiving method (Virtanen 1998, 77-78).

With the modern information technology, there is a third type of effective dissemination method available today, namely groupware media which refers to software enabling a group of people work together through networked computers. This modern groupware technology has captured features from both traditional methods. It is closer to oral dissemination in terms of its interactiveness than the written communication. On the other hand, it does not require synchronous communication and in this way it resembles written communication. (Pirttilä 1997, 74-89)

Alongside the effective modern dissemination solutions, such as Intranets and electronic mail, also traditional communication forms, e.g. fax, phone, informal and formal meetings are still to be considered important media. Technology can not completely substitute the more traditional distribution means. Therefore, in addition to developing effective computer-based systems, companies should also pay attention to encouraging the organisational information sharing culture. (Vaarnas et.al. 1998, 61-67)

According to Gofton & Ness (1997, 27), business information should be available for personnel throughout the organisation in which systematic storage of information has a significant role. Most of the information is not perishable when used and can be used by various information users and for various purposes. The basic aim of an information storage system is to enable users to find the needed information in a short period of time. Given the vast amounts of information in companies, this is clearly a difficult task. (Gilad&Gilad, 1985)

3.10. Time-Dimension of the Information Need

The time-dimension of the information need is related to the question, when information is needed? The time-dimension can be further divided into two factors, namely urgency and frequency of the information need, and these two factors are discussed in more detail in the following paragraphs.

According to Thietart and Vivas (1981), the **speed of communication** is of great importance. In fact, some pieces of information, such as project tenders, are perishable and thus their urgent utilisation is a critical factor. Actually getting the information faster is more important than getting it absolutely exact. A high speed of communication enables one to shorten the delay of reaction, and, in the case of threat, allows one to weaken the impact or at least to decrease the cost of response. Fast communication also facilitates decision making, and, in the case of uncertainty or urgency, is very important.

Two main causes explain delays in the communication of information: the necessary time to process information and the delay due to human behaviour. The uncertainty associated with an event may indeed lead to a verification procedure to check the quality of the information. In the same way, the individual may prefer to wait to use the information at the most appropriate time for himself: this is an instrumental delay. Finally, the individual may reject unfamiliar or unusual information and consequently never communicate an important piece of information. As a result, problem of delay in the communication of information is a crucial one that top executives must tackle to insure good strategic response capacity. (Thietart & Vivas 1981)

Hawkins & Tull (1994, 25-27) have categorised business information in three groups, i.e. recurrent, monitoring and requested information, depending partly on the information need in terms of **frequency**.

Recurrent information is information that is provided on a periodic basis. Examples of what information managers frequently receive on a weekly, monthly, quarterly, or annual basis are market shares, customer awareness of the firm's advertising, prices of competitors, customer satisfaction and consumer purchase intentions. Recurrent information is particularly useful for indicating problems and opportunities. Moreover, it can be used to determine the effects of solutions to potential problems. Recurrent information is mainly distributed in the form of reports. (Hawkins & Tull 1994, 25)

Monitoring information is information derived from the regular scanning of certain sources. Monitoring information comes primarily from external sources such as reports and articles. Internal sales call reports and accounting records are also subject to monitoring. Monitoring information is particularly useful for alerting firms to potential problems such as new competitors or new marketing activities by existing competitors. (Hawkins & Tull 1994, 25-26)

Requested information is information developed in response to a specific request by a manager. Without such a request the information would not be delivered to the manager. For example, a manager might request information on the size of a market not currently served by the firm along with an assessment of the intensity of competitive rivalry in the market and the level of customer satisfaction with the current brands in the market. (Hawkins & Tull 1994, 27)

Of the six various information products categorised by Vaarnas et al. (1998, 14-19) in the chapter 3.8., periodical follow-up research can be included in the Hawkins´ and Tull´s (1994, 25-27) category of recurrent information, when the time-span is studied more specifically. Small-scale case-by-case data checks and ad-hoc market surveys, on the other hand, can be included in the category of requested information, whereas the category monitoring information matches directly with continuous monitoring information. Market information in computerised information systems can basically include the outcome of the other five components.

According to Robson (1997, 87 ref. Gorry & Scott-Morton 1971), information is needed less frequently on strategic level than in the tactical or operational level. This statement is supported by Pirttilä (1997) who has come to the conclusion that information that is not needed frequently is most often information on past or future events being thus mostly related with strategic level.

Atkinson (1994) states that for tactical decision making, he needs the actual development of customer base and labour force availability year on year, with a three to five year projection. Moreover, he wants this information quarterly, in computerised format so that he can easily combine it with other information, for decision making. On the other hand, operationally, he needs day-by-day, real-time information either electronically or by a facsimile or by phone. If the information can be accessed so that it is from the same reliable source and can already anticipate format, media and update frequency, then the manager is going to save time, money and bad decision making.

In a study made by Palvia et al. (1996), information users were asked to indicate the frequency of the use of each information type on the following scale: daily, weekly, monthly, quarterly, yearly, or a less frequent basis. The results show that for most firms, information needed to be accessed on a monthly, quarterly, yearly, or a less frequent basis. This is consistent with the literature where many executive information needs are described as non-routine and ad-hoc. However, information when needed, needs to be accurate and timely. One interesting finding in this study was that the information types which were considered as the most important ones, were not necessarily demanded most frequently.

3.11. Development of the Need for International Business Information During the Internationalisation Process

According to Kennedy et al. (1997), information need is situation or task dependent and evolves as the person goes from one stage of the task to the next. Observation and experience tell us that information need does in fact alter over time. The concept of a "focus continuum" is based on the extent to which facts are identified and associated for a situation. In this model, at the beginning of the project the information need of the user is in a "definitional stage," requiring "diffuse" information to provide perspective. At the end of the user's project, the information need becomes focused, well defined, and requires precise "answers." If a person wishes to know "Who was Tycho Brahe?," a relatively simple biographical search will reveal that Tycho Brahe was a sixteenth-century Danish astrologer with a silver nose. The factual aspect of the question is answered with this information, but not the information need, which immediately evolves. The answer "silver nose" creates additional questions in the person's mind, with repercussions for the undergraduate's assignment. Consequently, the information need evolves gradually.

Frankelius and Rosén (1993, 61) have presented the same idea differently, as they state that one has to have information about the business environment before one can actually know what kind of information is needed. Otherwise, one is just making wild guesses about the real business environment for the company and the related information need. Consequently, a business information management system has to be built in a way that the information requirements can be updated along the development of the company's business and the external operating environment.

According to Vaarnas et al. (1998, 29-36), this phenomenon of evolving information needs can be well applied to the internationalisation process of companies. Thus, the further the company is developing its international operations the more specific information it needs on the external environment and the respective market.

Cavusgil (1985) has a similar view by suggesting that the information requirements of firms vary based on different stages of market research. In the preliminary screening stage, information about the physical, political, economic, and cultural environment is most important. When analysing industry market potential, market access information, such as limitations on trade, tariff levels and quotas, legal restrictions, local production, imports, consumption, and conditions for local manufacture, is necessary. For the analysis of company sales potential, he recommends that information about size and concentration of customer segments, projected consumption statistics, competitive pressures, and costing methods be available.

4. Analysing Business Information Needs in an Internationally Operating Company

4.1. Motivation for Conducting an Analysis on the Business Information Needs

4.1.1. Consciousness of the Needs for Business Information

Pirttilä (1997, 45) categorises information needs to conscious needs and unconscious needs. Information need is thus difficult to operationalise, and organisational participants are therefore not necessarily able to articulate or express their true information needs, even if sophisticated methods were to be employed. In general, work related information needs may arise when an individual recognises that his or her current store of knowledge is insufficient to cope with the task at hand or to resolve conflicts in a subject area or also to fill a void in some area of knowledge.

Belkin's (1980 ref. Goodman 1993) "anomalous states of knowledge" theory postulates that information seekers are often not able to specify their real information needs. They may recognise that a problem exists and that information might be needed to resolve it, but not know what information they need. When they do not describe their situation and ask a person familiar with the information holdings to help determine the best data and sources, they often ask for one record when in fact they need another to make a decision or solve a problem most effectively. They then may receive information which is not what they really wanted or needed and judge the information received to be irrelevant.

This general theory by Belkin is applicable for top-management as well. According to Rosén (1996, 48), in most strategic models it is automatically assumed that the management of a company knows what kind of information they need, which is, however, not the reality. Furthermore, Fuld (1991) has come to the conclusion that one of the misconceptions that regularly surface is that senior management understands the organisation's chief information needs. In reality however, senior management perceives only a small part of the organisation's information needs.

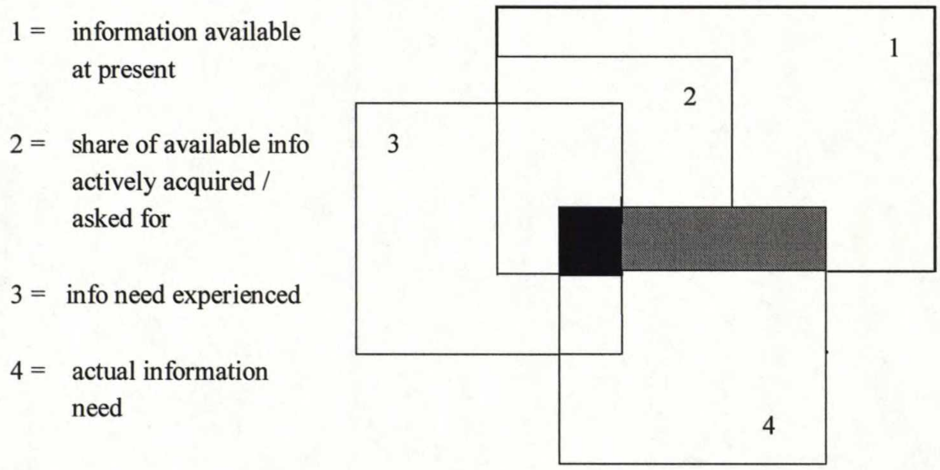
According to Simpson and Prusak (1995), research and other types of information gathering activity are frequently hampered by a poor understanding of what the end-user actually wants or expects. All the information gatherers, in certain situations, will search for information in apparently random manner with only a vaguely formulated idea of problem or need.

As a conclusion of the four previous paragraphs, it can be stated that the consciousness and knowledge of information needs is often poor and does not depend on whether the user of the information will be the information seeker himself, some other person or the organisation on the whole. The information seeker and user may have some perception of the need, which, however, may be far from the actual which can be found out with a thorough information need analysis (Rosén 1996, 51-52).

According to Rosén (1996, 51-52), the picture of a company's actual information needs, which emerges from an analysis, usually deviates significantly from the information needs perceived by the participants prior to the analysis. This view has previously been presented by Ghoshal and Kim (1986) as well, who state that there is substantial overlapping between information wants and information needs that are not being met.

In general, Rosén (1996, 51-52) classifies information into four different categories: 1) information already existing within the company, 2) that part of existing information which has been actively acquired, 3) perceived or experienced information needs, and 4) actual information needs. A very small share of the information that is important is perceived as being important, and is also available to the organisation. This is illustrated in the following figure 3, where only the small shadowed rectangle in black colour corresponds to the information that is important, perceived to be important and also available to the organisation. Moreover, needed information that is available but the importance of which is not understood (grey area in rectangle 4), is in most cases considerably large.

Figure 3. Only a Small Fraction of the Information We Have Access to Corresponds to Our Needs



Source: Rosén 1996, 52

4.1.2. Benefits of Knowing the Information Needs

The number of useful information sources in the world grows by leaps and bounds. It is important that we keep learning how to use them efficiently, but it is necessary also to keep in mind that the individuals who ultimately make use of all this information are limited in terms of their information handling capacity. Flooding managers with more information than they need is generally counterproductive, as managers soon begin to ignore the relevant as well as the irrelevant information. What they need is not more information but better and more accurate information. (Rosén 1996, 54) Otherwise, the result will be an information overload which paralyses managerial work and may even end up to an "information fatigue syndrome" presented by Oppenheim (1997) as well as the guide book published by the business information company Reuters (1997).

A clear advantage of the information need analysis is that it will give more realistic view of the company's or individual's information needs compared to the mere perceptions. Furthermore, knowledge about needed information could provide clues about why pertinent information may not be utilised. It could also enable improvements in information systems and in client information-seeking behaviour. Information managers and archivists can use this knowledge to help ensure that needed information contributes to management functions. Several of these ways are evident. They could, for example, identify and evaluate internal and external information resources, identify needed information which is not maintained, enable information access through streamlined retrieval systems for active and inactive records, provide information analysis services, and ensure that information is presented in a manner which will help ensure its effective use. (Goodman 1993)

The better the information user is able to determine his information need the more likely it is that the information gathering will be successful. If the needs are not defined accurately it will lead into gathering of information that is not required and a lack of essential information. Consequently, the need determination saves lot of time and money when it is conducted properly. (Vaarnas et al. 1998, 85; Markkinatieto-opas 1994, 18-19)

4.1.3. Importance of Need Analysis when Building Business Information Management Systems

Despite of its acknowledged importance, defining information requirements is perhaps the most neglected aspect of the information management process. One explanation is that the high costs of implementing information technology generally focuses management's attention on the technology (hardware and software) and pre-empts discussion of issues concerned with the information itself. (Berkley & Gupta 1995)

Nevertheless, information need analysis is of utmost importance when an organisation is developing an information system such as an executive information system (EIS) or a business intelligence system. For example Fuld (1991) has stated that executives charged with building their company´s intelligence programs must first identify the organisation's information needs, information resources, and communication channels. Similarly Gilad and Gilad (1985) have written that the first step in designing a business intelligence system requires defining goals, targets, and priorities. This first step identifies what information is relevant to company goals and strategies and directs the choice of information sources. According to Sawka (1996), defining intelligence needs is an absolute prerequisite not only for the daily operations of an intelligence system, but for the basic design parameters of that system. Needs definition ensures that the intelligence system is organised specifically to collect and analyse information on which management has a predisposition to act, because of some strategic objective or business need, and it ensures that management is fully engaged in the intelligence process.

According to Rosén (1996, 54), it is not wise to install a sophisticated information processing system or to increase the flow of information from external sources before one has assessed the organisation's actual information needs. This statement is supported by Kamppinen (1996, 101-104) whose main finding is that a very significant reason for the failure of introducing a competitive intelligence system in a company, is the failure to accurately define the purpose of the system and the related needs. This leads to insufficient commitment of the future users, and therefore a low usage of the system. The more involved the users are in the information requirement definition phase and the approval of the user interface, the more likely they are to accept the system and utilise it correctly.

4.2. *Choosing the Need Analysts*

Calof (1997) has put together a criteria list for choosing the analyst or analyst team for conducting a business information need analysis as follows:

- The analyst has to understand how to identify and elicit the information needs of decision-makers exactly
- The analyst has to develop effective communication, interviewing and presentation skills.
- The analyst has to understand the basic psychology types in order to appreciate the different orientations of decision-makers.
- The analyst has to know the organisational structure, culture and environment as well as the key informants.
- The analyst has to remain objective.

Regarding the responsibility of tracking management's information needs, Sawka (1996) argues that it ought to be given to an individual or a team. The team can be either composed of own personnel, outside consultants or as a combination of both. Nevertheless, clear responsibility need to be assumed.

Given that the needs evolve and have to be regularly tracked, it can be argued that internal implementation will bring about more organisational learning (Sawka

1996). Moreover, conducting the business information need analysis demands good knowledge on the company's organisation, operations, and future strategies. It takes a long time before an external specialist gets the knowledge necessary about the company to be able to perform an in-depth analysis. (Finne 1996, 73)

On the other hand, using an external specialist should reduce the problem of neutrality. Moreover, according to Drucker (1995), even big companies, in large part, will have to hire outsiders to help them as typically there are very few people in the companies who have high competence in the field of business information. To think through what the business needs requires somebody who knows and understands the highly specialised information field. The external person in question, however, has to be extremely reliable and have back-up from the company's management.

According to Finne (1996, 73) information need analysis should be done by combining in-house expertise, external expertise and a usable model. The external business information expert has to be familiarised extremely well on the company's organisation, operations, and future strategies, and on the other hand he has to remain neutral and disseminate his knowledge on business information to the other members of the team in every possible way. In this way, group synergy can be created and there is a high probability of succeeding well in analysing the real business information needs within the organisation.

4.3. Methods for Analysing the Information Needs

There are various methods to analyse information needs in an internationally operating company, the most of which can be used separately or by combining various methods to a cohesive whole. One sure thing, however, is that the analysis has to be conducted in a proactive way as generally information users do not come and tell their information needs. As Fuld (1991) puts it, "it is a well-known fact that management poorly communicates its information needs to the field".

Selection of the analysis method depends on a variety of factors. First, the objective of the data sought must be determined. Standardised techniques are more useful in the collection of objective data than of subjective data. Also the degree of structure sought in the data collection needs to be determined. Unstructured data will require more open-ended questions and more time than structured data. (Czinkota et al. 1991, 339)

Watson and Frolick (1993) apply four strategies for determining information requirements for an executive information system (EIS): (1) asking; (2) deriving from existing EIS-system; (3) synthesis from characteristics of the utilising system; and (4) discovering from experimentation with an evolving information system.

Hedin (1998), on the other hand, suggests three basic methods for determining information needs when building a business intelligence system: personal interviews, focus workshop with group discussions and information gap analysis by surveys. Wetherbe (1991) supports the use of group discussions for joint application design, whereas Allison's (1996) study regarding UK companies, on the other hand, revealed that organisations in practice have adopted individual interviews as the principle means of discussion. These discussions were either driven from written requirements as drawn up by the executive or an initial screen prototype created by the information service team. However, two firms applied by combining the use of one-to-one sessions and group workshops.

Rosén (1996, 49) suggests that there are four alternative methods for determining which information is important: (1) common sense, (2) checklists, (3) experience, and (4) a formal procedure. This categorisation is, however, somewhat confusing as it is self-evident that common sense is not enough for a complex organism such as a modern organisation and it is quite difficult to differentiate common sense from experience. Moreover a checklist can to a considerable extent thought to be a formal procedure.

Fuld (1991), on the other hand, suggests that executives must conduct a series of in-depth surveys of key departments to determine how staff uses information and what information they need. In practice, to develop a realistic picture for assessing intelligence program, three steps should be taken. First of all, the analyst should have preliminary meetings with the senior management to determine their perceptions of information needs. Secondly, he should conduct assessment interviews with senior managers and midlevel managers to understand their information needs. Finally, the analyst should analyse the results to identify the broadest common base of information needs.

Ylihärsilä (1991, 62) found out in her study that accurate knowledge on the information needs could be obtained by the use of different information requirement determination methods simultaneously as well as focusing the questions on the direct value of different kind of information to the decision making and planning. In practice, she carried out the interviews with open questions, and states that brainstorming might also have been a good method.

Based on the previous discussion, we can come up with the conclusion that the mostly used analysis methods are the following:

1. Focus Group Discussions & Brainstorming
2. Personal Interviews
3. Surveys
4. Checklists
5. Previous Experience, Existing Systems & Common Sense

A focus group consists of a small group of people with similar interests facilitated by an independent chairman. In **focus group discussions**, by putting people together the synergy of the group leads to a pooling of ideas and any conflicting objectives of different functional areas can be resolved. They are useful for getting at some of the less obvious issues that would never be picked up from more structured interviews or questionnaires (Wilson 1997, 212). Group sessions are to be followed by a structured interview with each executive. The interview can take different forms, but should look to draw out the requirements by phrasing the questions for most effective response. (Wetherbe 1991)

There are two types of **interviews**, unstructured and structured. Unstructured interviews require little or no preparation. Structured interviews require the analyst to prepare the questions in advance and then allow little deviation. The advantages of interviewing include understanding, motivation, insight, honesty, and the ability to ask probing questions. The disadvantages include cost and need for interviewing experience. Being a costly method, the information needs should be prioritised in the interviewing phase. This would enable making compromises to serve the most important needs of the largest part of the clients. (Saldarini 1990, 105; Liukko 1994, 26-27)

Survey by questionnaire allows the analyst to obtain data from a large group of people within a limited time. Questions can be open-ended, which allows the respondent to print any reply; closed-ended, which lists several choices for the respondent; or a combination of both formats. The advantages of questionnaires include volume, timeliness, easy tabulation, low cost, conciseness, and anonymity. The disadvantages include apathy, suspiciousness, inflexibility, presumptions, invalidity, extensive design requirements, and short life. (Saldarini 1990, 105) Questionnaires seem to be falling out of favour for the reasons as described. More direct approaches are made to the people whose view is being sought. The value of questionnaires, however, increases if they are validated by the use of focus groups or other interactive methods. (Wilson 1997, 212)

According to Finne (1996, 68), **checklists** are lists with questions that the user goes through. The questions are mostly Yes/No questions and not very informative. Checklists can be successfully used to get a rough overall impression of the issue. However, mostly they are not informative enough. Another problem is the size of checklists as they are typically dozens of pages long. This means that very few in the company have time enough for going through them.

Experience is one of the cornerstones especially when building a comprehensive information system for the company. If some kind of an information system exists, a lot can be learned from how well it is perceived to serve the users; what should be maintained and what changed (Ylihärsilä 1991, 63).

4.4. Applicable Models for Analysing the Need for Business Information

4.4.1. Customer Need Analysis as the Base for Analysing Business Information Needs

The users of international business information can be considered as customers of the company's information service unit or business information management system. Consequently, models to analyse customer needs can to some extent be applied to the analysis of information users' needs.

Keiser (1994, 103-105) has developed a model for developing new products and services for the customers of the company's information service centre. This six-step program reflects many characteristics of an information need analysis.

1) Segmenting the market: Your market is your organisation as a whole, departments within the organisation, and individuals within those departments. Each has its own distinct information needs and wants (i.e.

opportunities for you), and those wants may be as important to satisfy as the "legitimate" needs.

2) Establishing priorities: To what you may have been told at library school, all customers are not equal. If you are going to develop new information products, it makes sense to concentrate on developing products that will make the most difference to your organisation, either in terms of increased sales, decreased cost, or increased productivity. First of all, look for those groups that are strategically important for the organisation. Secondly, look for role models within your organisation, those "rising stars" or individuals to whom others look for guidance. There are some activities within the corporate setting that are information-intensive (e.g. marketing, sales, strategic planning, R & D). Why target a department that is likely to be a "hard" sell, when there are plenty around that appreciate what information can do for them. Finally, consider the time it will take to develop a product to meet the needs of your customers. Some information will be easier to get hold of than other data. If you can satisfy three or four groups at the outset, it may make sense for you to do so, even if these information products are not as important as another that is difficult to develop. In essence, you are trading off quantity to quality, but the PR derived from the business decision may take this an acceptable risk.

3) Identify specific information needs. Assess the information needs of your market through an initial group meeting which sets the tone for the project. Explain who you are and why your library or information centre is looking for guidance in the development of new information products and services it will offer in the future. You want their help and advice in making these tough choices, knowing that resources are scarce and efforts must be targeted to where they will have the most impact on organisation. During the following week, conduct individual interviews and get people to talk about what they do and where they feel information could help them do better. Bring the results of all these interviews to the rest of the staff, and as a group, brainstorm potential new product ideas.

4) Prototype products: Once you have got a list of potential new products to offer, team members of the staff to flesh out each, analysing how this might be accomplished, and what it might cost to do so. If possible, create a sample or two.

5) Return to your initial focus group and ask the participants to set the priorities. Which product do they feel needs to be developed now, and which can wait until later on? What suggestions do they have for improving the content, scope, format or mode of delivery?

6) Create a wider audience: Take the new product you have developed for this group and think about other groups within the organisation with similar information needs? With a minor adjustment, can you offer this same product to another department?

Maunula (1997) has a very similar type of model when analysing the customer needs for business information services in the Finnish insurance company Pohjola. Her process includes the following four phases:

1) Find out the basic characteristics of the customer (responsibilities and activities)

2) Find out the information needs of the customer (focal points and critical information types)

3) Determine the product characteristics of the needs (degree of processing, urgency, method of dissemination)

4) Make a crosstabulation of the customer needs by customer segments, after which you can prioritise segments and the identified needs.

Both Keiser (1994, 103-105) and Maunula (1997) bring up important issues when analysing customer needs for developing product offering in the information service centres. First of all, getting to know the information users, i.e. customers, is emphasised which allows segmenting of the customers. Secondly, the analysis is not only related with listing needed information types, but tries to prioritise these information types and also involves identification of needs related to the analysis and dissemination of the needed information covering thus most dimensions of business information needs.

4.4.2. Information Audit by Reuters

According to the business information company Reuters (1997, 12), an information strategy is the only way to ensure that everyone in an organisation has the information they need to do their jobs effectively. It should also greatly reduce the quantity of data that is erroneous, irrelevant, or dublicate.

For organisations that do not have an information strategy in place, an enterprise-wide information audit is a crucial first step. An audit identifies where information is located and how accessible it is. It should also look at information needs and compare them with the systems in place to meet these needs, to pinpoint any gaps or excesses. A prerequisite of the information audit is the accurate definition of job responsibilities. (Reuters 1997, 16)

Information audit checklist (Reuters 1997, 16):

- What information does each individual or work group within the organisation need to do their job effectively?
- How frequently is this information needed?
- Do other individuals or work groups in the organisation require the same data?
- What systems and resources are in place to fulfil these requirements?
- Do current information systems and resources match users' needs?
- Do individuals within the organisation receive information they do not need? Do they lack essential or useful information resources?
- Could some information be shared? Is it being duplicated?
- What action needs to be taken to ensure that every individual within the organisation has the necessary information to perform effectively?

Moreover, the audit should also examine the effectiveness of each single information resource in turn, the benefits it brings to the organisation (and whether this compares favourably with the benefits achieved), and how the cost/benefit ratio could be improved (Reuters 1997, 16).

The Reuters' information audit includes some dimensions related to the organisation's information needs such as information content and frequency of dissemination. Most of the factors, however, are related to the current situation in the company and are thus not related to actual needs. Moreover, the information audit covers the information needs of the organisation, but does not take into account the individual needs within the organisation, which are of utmost importance. Consequently, an information audit is certainly useful when developing company's business information management procedures, but not directly applicable when needs are to be analysed with a comprehensive approach including all the elements of business information needs.

4.4.3. Need Analysis Through Identification of Critical Success Factors

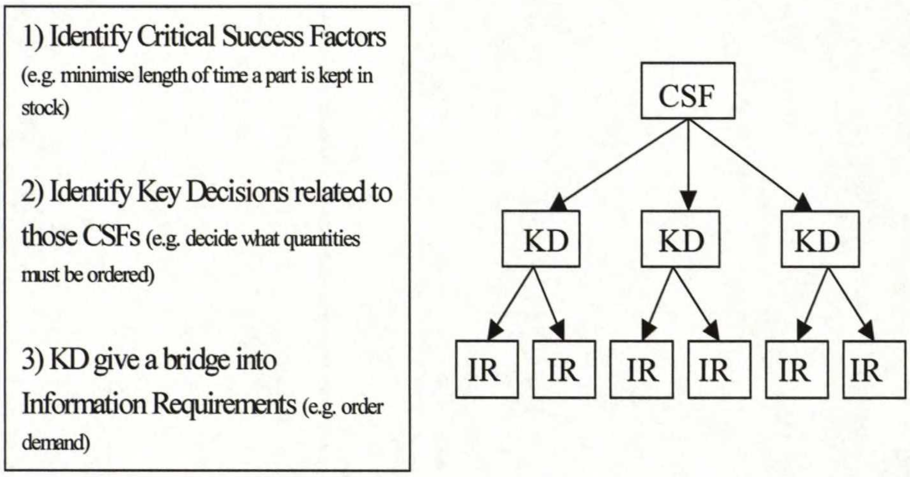
The critical success factors (CSFs) approach was introduced by Daniel in 1961, but it is best known as presented by Rockart in 1979 (Huotari 1997, 11). According to Rockart (1979) critical success factors are areas of activity that should receive constant and careful attention from management. They support the attainment of organisational goals which represent the end-points that an organisation wants to reach. Robson (1997, 154), on the other hand, states that critical success factors are those handful of things that within someone's job must go right for the organisation to flourish. Critical success factors for an organisation derive from the business objectives and may be, for example, to create new markets, find a new product, automate factories, develop worldwide image and improve product quality (Robson 1997, 156).

According to CSF approach, the cornerstone for building a compact, useful management information system is the determination of each executive's information needs. This requires, first of all, a clear grasp of the individual's role in the organisation, his responsibilities, his authorities, and his relationship with other executives. (Huotari 1997, 11)

According to Rockart's (1979) view, the process of a CSF analysis allows managers, initially, senior ones, to articulate their needs in terms of the information that is absolutely critical to them. Moreover, CSFs are not information needs for strategic planning, which would probably be far too unpredictable, but the information needs for management control (tactical level), where data needed to monitor and improve existing areas of business can be more readily defined. This latter approach of CSFs being not linked with strategic planning, however, has later on been opposed by various researchers (Robson 1997, 154-158).

Robson (1997, 154) suggests that **strategic** information requirements can be uncovered by a three-stage process: firstly the identification of a number of critical success factors, secondly the critical decisions to be made, and hence finally the information required to support those decisions. Consequently, the key decisions to be made serve as a bridge into information requirements identification, which can be seen in the following figure 4.

Figure 4. Analysis of Information Requirements (IR) Through Critical Success Factors (CSFs) and Key Decisions (KD)



Source: Robson (1997, 155)

CSFs differ from one industry to industry, between organisations within the same industry and from one period to another even in the same organisation. There are therefore five influential factors to consider when eliciting a manager's handful of CSFs (Robson 1997, 155):

1) The industry: all organisations within one industry will share these
2) The competitive strategy/industry position: large players may determine these for the smaller players
3) Environmental factors: the economy, country or politics etc.
4) Temporal factors: those not "normally" of concern but are so "for a time"
5) Managerial position: the CSFs will vary with the level in the hierarchy, the higher up the management triangle the more likely it is that CSFs will be of

the "building" variety – tracking the progress of changes. Lower levels of management have CSFs relating to "monitoring" of current operations.

Ward and Griffiths (1996 ref. Robson 1997, 156) argue that there will be a structured relationship such that the industry CSFs will influence organisational CSFs which in turn shape the CSFs of the particular area of the business which, of course, form the CSFs of a particular manager.

In Huotari's (1997, 17) case study of a Finnish publishing company, information auditing by using critical success factors was conducted to find out the individual information needs of the executives, managers and specialists. Firstly, the measurement of the performance of the stated critical success factors was to be defined. Secondly, the information (internal and external) necessary to improve the performance of the critical areas in each executive's field of responsibility was to be defined along with the possible problems experienced in defining and obtaining that essential information.

In the personal interviews used as the primary method, Huotari (1997, 20-23) simply asked the interviewees to evaluate three most important critical success factors for the company, which were then defined as concepts to form categories. First, the concepts were open-coded by defining the content (meaning) of all the statements for discovering the sub-categories; second, they were axial-coded by defining the relationships between the statements by combining the subcategories of the same content (meaning) for finding out the general themes and subject fields. These broader general subject fields were then defined as the main categories. Finally, selective coding was applied for eliminating sub-categories which were very loosely related to the main categories.

During the phase two, the information needs of the executives were examined by concentrating on the critical areas in order to achieve the planned performance for the critical success factors. Firstly, the areas critical for the success of the case company were described and the information needs to monitor the development of these areas were analysed. Secondly, the analysis of each product sector and department was presented. The focus was on the information needed by the senior executives, the managers, and the specialists to monitor and make progress in the areas they were responsible for. (Huotari 1997, 36)

In Huotari's (1997, 31-35) case study, the following critical success factors were found in order of frequency: personnel, products, marketing, finance, information management, customer relations, efficiency and speed, and general management. Moreover, within the marketing and sales activities the identified critical success factors in order of frequency were personnel, products, sales, information management, finance, marketing and marketing channels, marketing communication and customer services (Huotari 1997, 120). Consequently, the CSFs within the company in general were in Huotari's study quite similar to the ones in one specific function i.e marketing and sales activities.

Shank and Boynton's article (1985 ref. Robson 1997, 159) gives a case study of the use and effects of CSFs and also gives some useful general guidelines:

- CSFs are very flexible which can entice some organisations to be too casual about their use. Casual application can provide false results. CSFs should be used with the same precision as formal methods.
- The person managing the CSF study should have a thorough understanding of the organisation's business. As with many other techniques the real discriminator for success is going to be the skill of the team and the degree of high-level commitment. Information system and senior management cannot speak the same language unless they both understand their common business goals.
- It is helpful to have a senior management champion, again, as always. This can motivate others to be more receptive in the early stages.
- Education of staff members in the CSF method before the actual interview is useful. A basic understanding of the concept and time to think before the first interview will make it productive.
- It is not recommended to link to concrete things such as information needs, computer applications etc. during the first round of interviews. Staff can be more productive and creative in identifying CSFs if their attention is directed away from the current information system realities.
- It is recommended to use several management levels in order to validate the CSFs and to get a broader picture and higher quality organisational CSFs.

CSFs have been widely used for various areas of information management. CSF analysis keeps a firm focus upon strategic issues, but obviously its weakness is that it needs very skilled and very perceptive interviewers to do the abstracting of CSFs from senior managers. The main strengths of CSF analysis are that it provides effective support to planning since the consideration of critical activities develops management insights and CSF analysis serves as the effective top level for a subsequent structured analysis. By contrast, another major weakness of the approach is that the more removed from the management apex a specific manager is the harder it is to apply CSF analysis; many managers who are not already involved in strategy planning activities find CSF analysis too conceptual and it is particularly difficult for those managers who experience the greatest turbulence. Additionally, it is usually impossible to build a true picture of the organisation's information requirements using only CSFs. A further difficulty associated with CSF analysis is that the resultant decisions may ignore any resource constraints surrounding their management. (Robson 1997, 159-160)

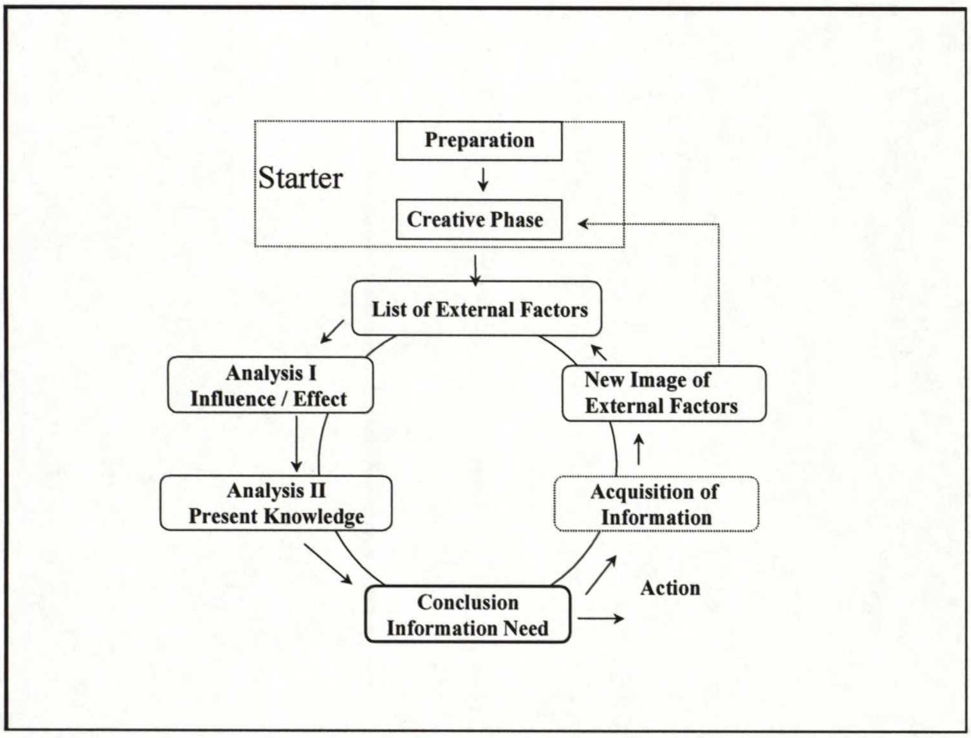
The model of using CSFs is very good in determining the content for the information need, i.e. what information is needed, which depend on the information user. The major deficiency for the model, however, is that it does not take into account the other dimensions of the business information needs. Consequently, the model has to be complemented by other approaches, in order to get a more comprehensive view of the company's information needs.

4.4.4. Defining Information Needs: A Creative Approach

Carl-Gustaf Rosén has done lot of work together with Per Frankelius in order to analyse business information needs in Swedish companies. The article "Defining Your Information Needs: A Creative Approach " by Rosén (1996, 45-54) summarises this work with a model that has been tested in numerous Swedish companies. The model takes the company's basic business mission as its starting point and ends up with a map of the company's external environment i.e. the map needed to navigate the company through a turbulent future. This method is summarised in the following figure 5.

The model presented in the following figure starts by identifying together with key employees of the company its basic business mission. After this the preparation stage involves a general discussion on how the fulfilment of that business mission is influenced by the access (or lack of access) to different kinds of information. (Rosén 1996, 49-51)

Figure 5. Creative Approach for Defining Information Needs



Source: Rosén 1996, 50

The next step is a creative phase, in which participants are encouraged to generate as many ideas as possible about external factors, which may influence the company in positive or negative ways. Rosén has found that a simple brainstorming session works very well. Spontaneity is important, hence participants are asked not to criticise any suggestions, which can be made from strategic perspective as well as from operative perspective. (Rosén 1996, 49-51)

In a surprisingly short time a long list of external factors is usually generated. The analysis of these factors is divided into two separate phases. First, the importance of each particular factor is evaluated both in short-term and long-term. Usually a consensus is rapidly reached, and the analysis continues with the next factor and so on. In the second phase, the same factors are analysed from a different point of view. This time we disregard the importance which each factor may have to the company and ask ourselves simply how well we are informed about it. By separating these two analyses, biased thinking is minimised, which is important in order to find the true information needs. (Rosén 1996, 49-51)

Based on the two-phase analysis of information needs, conclusions are drawn based on the gaps between the importance of the factor and present knowledge on it as presented in the following figure 6. The importance of each factor is rated long term and short-term as "High" (3), "Medium" (2) or "Low" (1), whereas present knowledge is rated as "High" (3), "Medium" (2) or "Low" (1). In this simplified figure we can see that although factor A is assessed to have a strong importance in future, our present knowledge is low, and hence there is a huge need for more information. In contrast, we find that we have an excess of information on factor C, at least in a longer perspective. (Rosén 1996, 51; Hedin 1998)

Figure 6. Conclusions About Information Needs

Factor		Importance			Knowledge			Info.need
		3	2	1	3	2	1	
A	Present		X				X	Modest
	Future	X					X	**Huge**
B	Present			X			X	OK
	Future	X				X		**Large**
C	Present		X			X		OK
	Future			X		X		Redundant

Source: Rosén (1996, 51) and Hedin (1998)

After conclusions have been made on the information needs, actions are started in order to retrieve the needed information. The model also takes into account the evolving nature of information needs as new images of external factors affecting the company's business are to be added as a feedback element to the cycle presented in figure 5. This reflects well the fact that analysing business information needs should be continuous or at least periodical. (Rosén 1996, 49)

Rosén's model has lots of similarities with the usage of Critical Success Factors presented in the chapter 4.4.3. It has the same basic limitation than the CSF method in the sense that it does not highlight any other dimensions of the information need than the existence and intensity of the need for various types of information. The model is, however, more oriented towards business information by trying to evaluate gaps in current information retrieval and takes into account the dimension of evolving needs.

4.4.5. Identifying Intelligence Needs in Establishing a Pull-Oriented Business Intelligence-Function

Hans Hedin (1998), a Swedish Business Intelligence consultant, encourages companies to build pull-oriented business intelligence systems, which require an identification of intelligence needs. This kind of demand-oriented approach contains three different methods for determining information needs. First method includes personal interviews in which multi-dimensional knowledge is sought. This means that the analyst should discover issues related to the managers personality, management style, background, work responsibilities, objectives, expressed information need, and information sources used currently.

The second method, a focus workshop, which Hedin (1998) has adopted from Per Frankelius and Carl-Gustaf Rosén, means a 5-6 hour group exercise with 7-15 participants including two phases. In the first phase, the people are individually allowed to identify external factors (i.e. types of information) on a piece of paper. These notes are then collected and similar factors are grouped together. During the second phase, group discussions are organised in order to discuss about the factors' relevance to the company's business as well as the present knowledge on these factors. These information needs are then prioritised and solutions identified, which can be seen in the figure 6 presented in the previous chapter. (Hedin 1998)

The third method suggested by Hedin (1998) is the information gap analysis to be done by a survey. In this method, various factors (i.e. information types) are evaluated according to degree of need and to the current satisfaction in receiving the type of information in question. Based on the responses, the analyst can make conclusions on the information gap, which is presented in the following figure 7. Filling the information gaps should be one of the main targets for developing the company's information system after the survey.

Figure 7. Information Gap Analysis by Survey

Factor	Info Need	Satisfaction	Gap
New competition	5	1	4
Competitors	5	3	2
Customers	5	4	1
EU	4	1	3
Focus Asia	4	2	2
New technology	4	4	0
Politics	3	3	0
Demography	2	4	-2

Source: Hedin 1998

Hedin's (1998) presentation of analysing information needs is good in the sense that it has a multi-method approach, of which the most suitable method(s) can be chosen for conducting the actual need analysis. On the other hand, the approach has the same limitation as Rosén's model (chapter 4.4.4.) and the approach of using Critical Success Factors (chapter 4.4.3.), that it is concentrated on analysing only the existence and intensity of needed information types. Consequently, also this approach has to be complemented by other approaches, in order to get a more comprehensive view of the company's information needs.

4.4.6. Case: Analysing Business Information Needs in Metsä-Serla

According to Tero Kaleva (Interview 1997) from Metsä-Serla company, analysing the business information needs has to go through three steps which can be formalised with working sheets in order to help in analysing and presenting the needs.

1) Users of information
   - Get into the details
   - Who needs what and when

2) Define the value of the information type to the organisation

   - Describe the result in plain words

3) Organise the development to a project

   - Business needs
   - Present situation
   - Target situation
   - Project time schedule and tasks

During the first step of the process, which is presented in the following figure 8, the information users are, first of all, categorised into segments based on business processes. After this the information needs of the business processes are listed in terms of needed information types and in terms of when the information is needed leading then to the identification of the information users in more detail within the business process categories. Finally, the current origins of the needed information are examined. (Kaleva, 1997)

Figure 8: Case Metsä-Serla - Step 1: Structure for Need Analyses / Users of information

Users of Information	What information?	Who needs?	Where does the info come from ?
Product Development			
Sales Management & Customer Service			
Marketing Communication			
Corporate & Division Management & Planning			

Source: Kaleva 1997

In the second phase of the need analysis, which is presented in the following figure 9, the findings of the first step are used as a basis for defining the value of the needed information types to the organisation. (Kaleva 1997)

Figure 9: Case Metsä-Serla - Step 2: Value to the Organisation

Users of Information	Description of the Value to the Organisation
Product Development	
Sales Management & Customer Service	
Marketing Communication	
Corporate & Division Management & Planning	

Source: Kaleva 1997

The third step of the model used in Metsä-Serla, which is presented in the following figure 10, involves the identification of present activities and future targets as well as present tools and future systems to be developed for managing the needed business information. (Kaleva 1997)

Figure 10: Case Metsä-Serla - Step 3: Present Situation

Users of Information	Present Activities and Tools	Future Targets and Systems
Product Development		
Sales Management & Customer Service		
Marketing Communication		
Corporate & Division Management & Planning		

Source: Kaleva 1997

The model used in Metsä-Serla is relatively interesting in the sense that it segments the user groups of business information, reflecting thus the views of Keiser (1994, 103-105) and Maunula (1997) presented in chapter 4.4.1. The focus, as in most of the models, is strongly on the information content, although the dimension of information users and the dimension of when the information is needed are covered as well. On the whole, the model is, however, limited to some extent and does not include e.g. the prioritisation of the needs, which should be of utmost importance.

4.4.7. Defining Information Requirements by Business Systems Planning (BSP)

Business Systems Planning (BSP) technique was initially developed by IBM's internal use and then sold as a service in the 1970's. It is fairly lengthy process that offers a structured approach to planning via a number of fairly rigorously defined stages that lead from the identification of business processes to a definition of required data structures. The steps needed to conduct a BSP study are summarised in the following list. (Robson 1997, 163-164)

1) Gaining executive commitment: Needs a top sponsor and a team leader (might be the same person) to head the study team of 4-7 managers.
2) Preparing for the study: Team trained in BSP. They compile data of organisation's business functions and current information systems support, produce a work plan, interview and review schedule and final report outline.
3) Starting the study: Sponsors review study's purpose with the team. Team leader reviews the compiled business data.
4) Defining business processes: team identifies the business processes which form the basis for management interviews, the definition of the future information architecture and other study activities.
5) Defining data classes: Data are grouped into classes based upon their relationships to the business processes. Charts are built.
6) Analysing current systems support: Team identifies how information systems currently supports the organisation. Charts to show organisational processes and the responsible departments.
7) Determining the executive perspective: Executive interviews gain commitment and help team to understand the problems whose solutions will be the future systems (modern versions of BSPs use CSFs).
8) Defining findings and conclusions: Team develops categories of findings and conclusions and then classifies previously identified problems into the categories.

These phases are then followed by planning stages including: defining the information architecture, determining architectural priorities, reviewing information resource management, developing recommendations and action plan, and reporting results (Robson 1997, 164)

The fundamentals of BSP analysis are that data is tracked as it flows throughout the organisation by the business activity it supports or results from. Outputs then go on to become inputs so data use and creation can be mapped for the whole organisations. The approach concentrates upon conceptually designing an overall corporate database, the "enterprise data". The systems that result are supposed to be lasting since they deliver the long-term needs, they reflect the business strategy and they take advantage of database technologies. (Robson 1997, 163)

BSP's main features are (Robson 1997, 163):

- Assumption that a central data repository exists
- Requires the definition of business processes
- For each process it must define the: 1) key success factors, 2) key decisions, and 3) key problems
- Primarily aims to produce models of the data structures
- Since it has no built-in recognition of the organisation's position it tends to be rather unrealistic
- Can be very difficult to complete the study

A BSP study generates huge volumes of information. Whilst the definition of business processes gives it the potential to be a business impacting tool, the overall "wrapping" of the technique ensures that it is inherently conservative and therefore it is most unlikely to do anything beyond produce data models of existing practices. (Robson 1997, 164)

BSP focus in uncovering data necessities, and so where data detail is wanted the BSP may score over CSF analysis. Where business direction focus is wanted CSF will score most highly. (Robson 1997, 166) In terms of analysing business information needs, the BSP concept is too much information systems oriented, too in-depth, and could only be applied to very large organisation with massive information flows. Even in this case, the analysis might take such a long time that it would be already outdated when finished. The idea of identifying specific information needs based on business processes, however, can be utilised in general and reflects the views of Kaleva (1997) presented in the chapter 4.4.6.

4.4.8. A Disciplined Approach to Competitive Intelligence Analysis

Gilad et al. (1993, 107-113) have developed a disciplined approach to identify gaps and blind spots in competitive intelligence (CI), which can be applied to analysing business information needs in general. This systematic method for evaluating competitive intelligence contains three perspectives: 1) identifying specific needs for CI in a given decision, 2) evaluating the adequacy of CI on a given decision, and 3) studying the effectiveness of CI usage across departments, divisions or companies. The analysis for these blind spots includes the following four steps:

1) Identification of the decision to be studied or managed. This must be a specific project such as entering a new market, acquiring a company, or introducing a new technology, not something general such as "becoming more competitive".

2) Identification of the categories of competitive intelligence that are germane to this type of decision. This can be done with a panel of knowledgeable line and staff members, and may also include an outsider to avoid groupthink, or the tendency for a group of people who hold the same values to reinforce one another toward inaccurate conclusions.

3) Identification of the people who are the key players in making and implementing the decision. The identification is case-based, but for example in a case of product development decision, the identified key players were general managers, marketing managers, or technical managers (including R&D and production).

4) Rating each category of competitive information as to its importance and availability to the key player. From these ratings, a matrix of scores can be computed, after which comparisons can be made across functional classifications and management levels.

Even though this approach by Gilad et al. is concentrated on single decisions and the related information need, it includes many of the various elements of business information needs: information users, purpose for using the information, as well as the existence and intensity of information need. Consequently, this approach is relatively applicable for analysing the information needs in general, but has to be supplemented by needs related with analysis and dissemination of information.

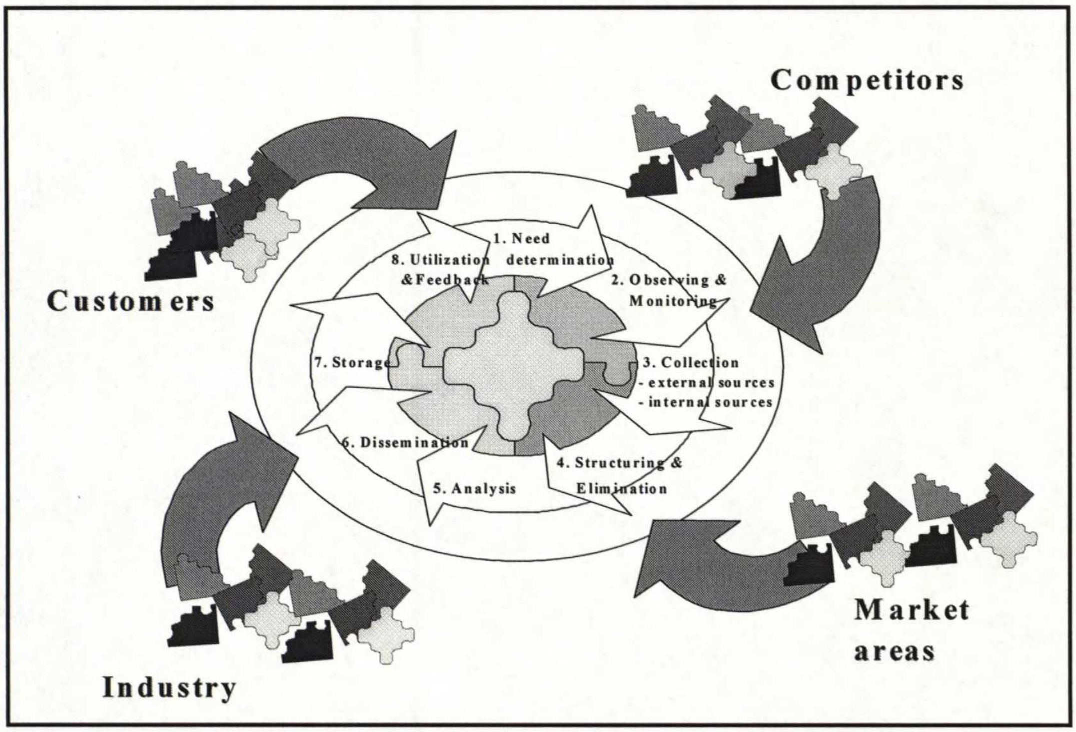
4.4.9. Linking the Business Information Needs with the Business Information Management Cycle

Calof (1997) has suggested articulating the business information needs into a business information management cycle, which is often referred as a business intelligence cycle. In general, this cycle can be argued to consist of eight overlapping phases starting from the need determination (figure 11.). The first phase is followed by monitoring and actual collection, structuring and elimination, analysis, dissemination, storage, and utilisation with feedback which in turn may lead to new emerging needs. (Virtanen 1998, 23-24)

Although a multi-stage model may seem theoretical, many companies seem to use such a process-diagram in order to visualise, understand and communicate the essence of business information activity and separate various tasks within the cycle. For example, in *Metsä-Serla* business information management is based on a model very similar than the one presented here (Kaleva 1997). On the other hand, in *Valmet Automation* a shorter process with collection, analysis, dissemination and use following the planning and direction phase is employed (Karjula 1997). This is, however, merely to simplify the presentation of the process as the elements of the shorter process involve more tasks.

The cycle concept can be viewed as a multiple process depending on the decision-making level in question. Firstly, in corporate strategic decision-making level, the cycle is likely to move relatively slowly starting from rarely changing information needs. Also the collection, analysis, dissemination and utilisation are obviously long-range tasks tied with the strategic decision-making periods. On the other hand, the division level strategic planning may need a faster cycle given more rapidly changing needs. Furthermore, when moving down to operative decision-making, the cycle is expected to become even faster. For instance, the sales manager may need monthly information about the external environment. (Virtanen 1998, 23-34)

Figure 11. Business Intelligence Cycle



Source: Virtanen 1998, 33

The business information that is managed in the cycle can reach the utilisation phase only if the whole business information management cycle is working in a need-based way. Consequently, the separately presented need determination phase in the previous cycle has to take into account the needs of the information users in all the other phases of the cycle. These phases on the other hand are strongly related with all the various dimensions of information need identified earlier in chapter 3.2. Thus, this concept of a business information management cycle is a very useful tool in analysing business information needs on a comprehensive basis. Nevertheless, it does not really give a solution for analysing the actual needs, but is more of a framework to be combined with actual need analysis methods.

4.5. Additional Guidelines for Analysing the Needs for Business Information

For the company's information officers it is difficult to know who needs what information, because information needs seldom follow the organisational structure. Someone might need the information, but does not know it exists, and thus cannot request it (Kamppinen 1996, 33). Consequently, **a mapping of the information users** in the organisation is extremely important.

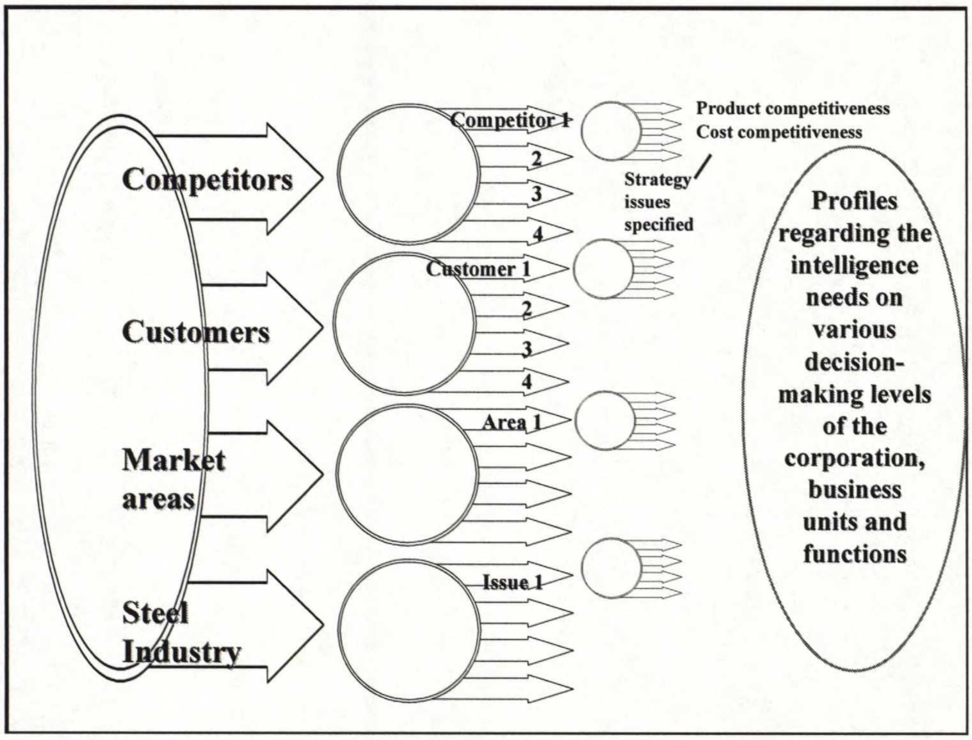
Another important factor is the **identification of the purposes for using the information**. According to Bentley (1988), information is the raw-material of decision making and that, in order to know what information managers need, we have to know what decisions they take. This quite obvious statement led to the development of a process named "decision information analysis", which sets out to establish the decisions that are made in the business, by whom they are made, their importance and their time cycle. When one concentrates on one particular decision, it is much easier to establish what information is relevant. This view is supported by Hawkins & Tull (1994, 48) as well, who indicate that the best approach for ensuring that any data collected are indeed relevant is to ask questions concerning the ultimate use of the data.

Furthermore, according to Pirttilä (1997, 47), the information needs in fact describe what business information it would be beneficial to have or what information a manager or a knowledge worker should want in order to achieve organisational goals. When this organisational aspect is taken into account, information needs are assessed, e.g. by analysing the decision-making process and determining an individual's or a group's principal areas of responsibility and decision-making, rather than asking managers or expert workers directly by survey methods what information they need.

Atkinson (1994) presents that one of the three critical things in marketing success is to **understand what type of information is needed**, so the appropriate breadth and depth of content is available in the best format for analysis and is updated with the appropriate frequency. To understand what type of information is needed, the company has to define its marketing process. To do this it is necessary first to describe the stages of the process at a macro level, then detail these stages into tasks and finally specify the unique activities that must take place for a task to be completed. When this stage is done properly, the information providers know what decisions will be made in what sequence, and who influences the outcome of the decisions. Then one can pretty well define what information is going to be needed, in what format and media and with what frequency of update, to bring about marketing success.

Virtanen (1998, 107-109) in his case study on *Rautaruukki* proposes that needed business information types, which he assesses as intelligence needs, can be first categorised according to the four intelligence element groups. Clear prioritisation of the competitors, customers, market areas and steel industry issues was raised up as an important issue, given that numerous decision-makers are struggling with information overload. Along the need analysis these four basic categories can be further categorised into smaller segments, e.g. four major international competitors or market areas may be chosen. Concerning each four competitors, for instance, the main issues to be followed can be determined using the gap approach. The intelligence users on a certain level may be interested in focusing on e.g. the strategy, cost competitiveness, product competitiveness, and service competitiveness of the competitor number one. It is possible to go further towards more detailed intelligence needs by using this intelligence need hierarchy. It seems that the more strategic the decision-making level, the less hierarchical steps need to be taken to determine the intelligence needs.

Figure 12. Hierarchical Model for Determining the Intelligence Needs



Source: Virtanen 1998, 108

The second aspect regarding need determination in the case of *Rautaruukki* deals with informal need evaluation. Several interviewees argued that instead of only setting up formal procedures for regular tracking of the intelligence needs, the actual role of the need analysts should include automatically understanding them. It can be argued that the kind of understanding calls for extremely close relationship between the need analysts, which in *Rautaruukki*'s case are intelligence staff, and the decision-makers and planners. The other notion behind automatic need realisation by intelligence staff is that it will be explicitly allowed to continuously propose and push ideas regarding possibly important issues so that the users may give immediate feedback. Thus, constant dialogue is required between the intelligence staff and decision-makers. (Virtanen 1998, 107-109)

Regarding the **prioritisation of the needed information types**, Harvey Wiseberg, of Advanced Technology Advisors in Cleveland, Ohio, assigns information to one of three categories: critical, relatively important, and nice to know. Then, to define objectives, he asks clients what they want to happen as a result of the information, and why. (Heath 1996)

Vaarnas et al. (1998, 86-87) emphasise the importance of analysing the **needed quality characteristics for the business information** to be gathered in terms of e.g. accuracy and recency. This part of the need analysis does not have to be in-depth and quantitative as the idea is mainly to give a rough idea of what kind of information should be actively looked for.

Different managers require different types of information. Furthermore, their information needs change, often in an unpredictable manner, over time. There should be an **on-going process of reviewing needs**, improving processes and practices and questioning the need for information. This will highlight changing needs, and these should be incorporated as part of an on-going development programme. All staff, and especially managers, have a responsibility for making continuous improvement, either incrementally or through more fundamental changes of working practice. These changes should be reflected in the support infrastructure, including information needs. (Wilson 1997, 208)

4.6. Problems in Analysing the Needs for Business Information

As in other projects, key success factors for the need analysis are the motivation of the respondents and the respondent's understanding of the importance of the project (Liukko 1994, 10). Often this is reflected in the time that the managers are willing to and able to allocate for this kind of extra activity. The need analysts are likely to face senior managers and middle-managers who are too busy to take seriously the exercise of preparing and updating long-range requirements. This problem can be lessened by active internal marketing of the project including the presentation of the long-term benefits for the respondent. Another factor for managing this problem lies in less formal relationships. Requirements must constantly be updated, which could be done in occasional informal discussions.

Identifying the correct information needs can prove to be elusive. The creation of a set of universal requirements based on organisational goals is especially difficult. A major stumbling block is that even when executive time is given to assist in the analysis process, it is difficult for them to identify their needs. The typical approach of many analysts to identifying requirements in any information system is to ask "what information do you need?" This leads to frustration on both sides. Of course an executive will try to identify items of importance, but the tendency is to focus on items which have been important in recent days or weeks. The process inevitably leaves out vital information. (Allison 1996)

According to Pirttilä (1997, 47), it should be emphasised that actual business information needs can be assessed fully reliably only with hindsight. What would have been beneficial to know e.g. as regards a past decision making situation concerning a reaction to a competitor's action can be evaluated. In advance, this assessment can in the worst cases be limited to mere guesswork. In addition, however sophisticated the method of assessing information needs from the organisational point of view, it is difficult to fully eliminate the subjective bias inherent in human estimation.

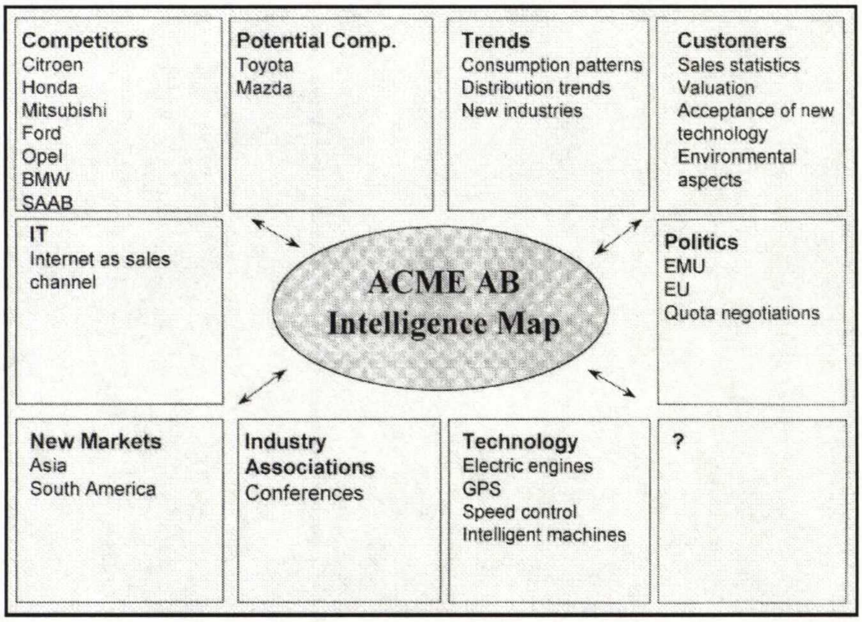
4.7. Presenting the Needs for Business Information

After conducting the analysis of business information needs, the analyst should go through the results to identify the broadest common base of information needs, and present these results in an appropriate format. According to Fuld (1991), the results should also be analysed quantitatively to show the general nature of the information needs. The quantitative model should clearly show the critical areas of needs, resources that can be used to fulfil those needs and communications channels that already are in place.

According to Hedin (1998), visualisation of the information needs is of utmost importance. For this, he presents two methods to be applied depending on the specific company: an intelligence map and a focus matrix. These methods are presented in the following figures.

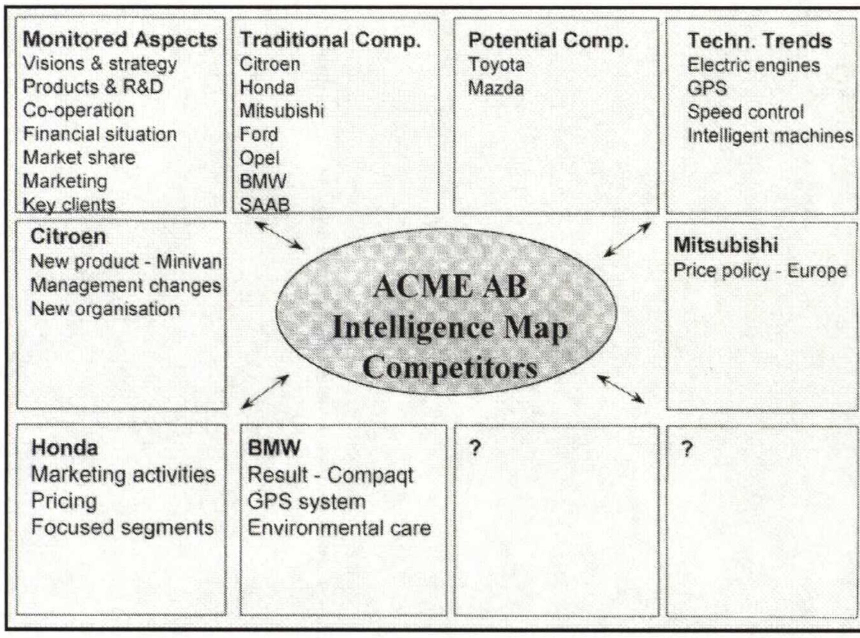
In the first method the main issues are advised to be put into an intelligence map, which is multi-dimensional. The figure 13 presents the first layer of the intelligence map, whereas the figure 14 presents the second layer of the map, going deeper to form subcategories for the initially identified information type categories in the first layer. Consequently, this map is very suitable for presenting information needs analysed by the method of Virtanen (1998, 107-109), which was presented in chapter 4.5.

Figure 13. Intelligence Map – First Layer of a Multi-Dimensional Model



Source: Hedin 1998

Figure 14. Intelligence Map – Second Layer of a Multi-Dimensional Model



Source: Hedin 1998

The other method, a focus matrix, is presented in the following figure 15. In this method, it is important that only the focus issues on each factor are recorded and that they are updated constantly.

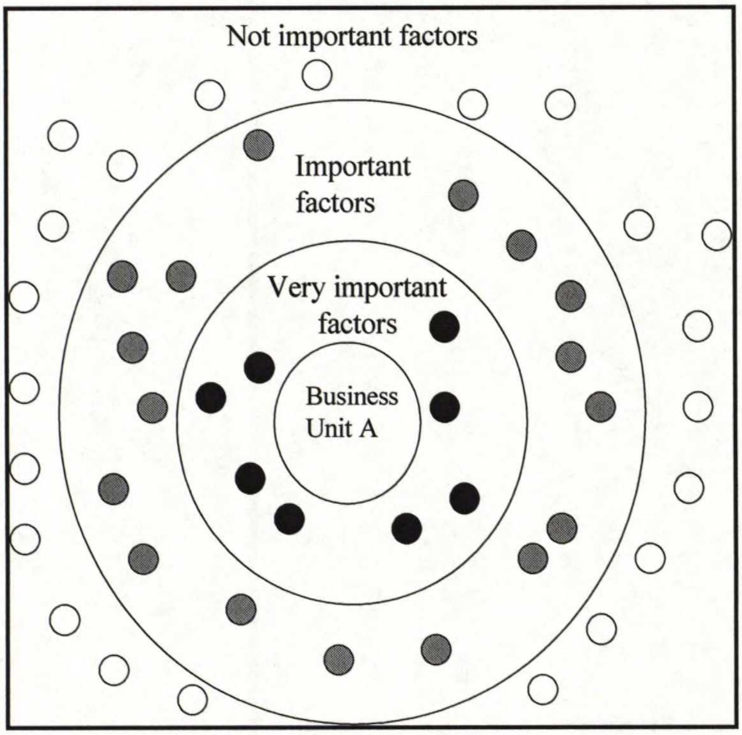
Figure 15. Focus Matrix

Focus / Competitor	Citroen	Toyota	Mazda	Honda	Mitsubishi	Renault
Co-operation	Alliance with Tec					
Production					New factory in Taiwan	
Finance			200 M$ in profit			
Strategy		New CEO Changes?				New focus in Asia
Technology					Developing electric engin	
Sales	-5% in Europe			20.000 in Abu Dab		
R&D						

Source: Hedin 1998

According to Rosén (1996, 52-53), the procedure for assessing true information needs, generates a model of the world around the organisation in several dimensions. One is the relative importance of keeping informed about different factors. In any situation where resources are limited, it is important to be able to attach an order of priority to things which require attention. This can be illustrated by drawing an information map around the organisation, which is presented in the following figure 16.

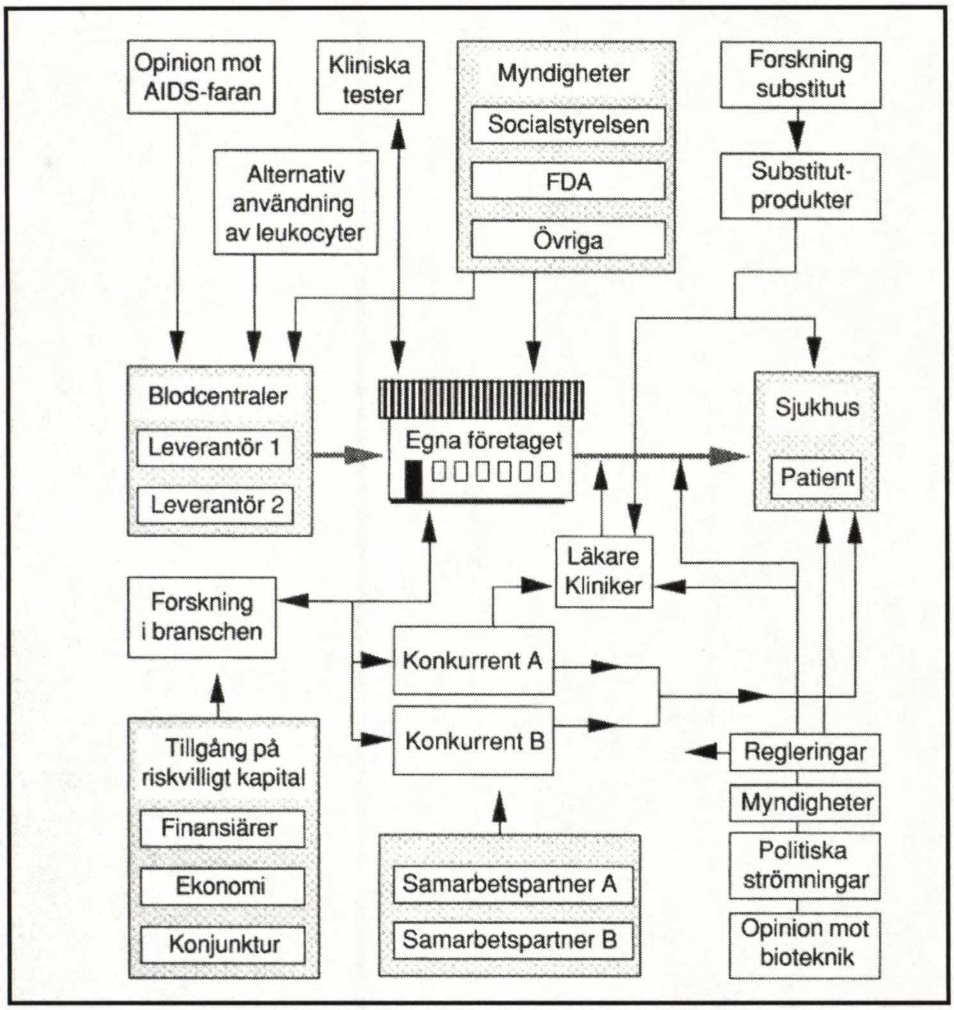
Figure 16. Information Map



Source: Rosén 1996, 53

A more useful map is illustrated in figure 17 (in Swedish language), which emerges from an analysis of an organisation's information needs. In this case, Rosén has illustrated the situation for a small pharmaceutical company called Virutech, which develops a biopharmaceutical (antivirus agent) from white blood cells. In contrast to most models of a company's external environment, this map is not limited to a certain type of actor or factors. It illustrates that many factors outside the obvious ones, such as customers and competitors, influence a company's success or failure in the market place. (Rosén 1996, 52-54)

Figure 17. Simplified Map of a Company's Environment



Source: Rosén 1996, 54

Given that the needs are difficult to be expressed, it seems useful to focus on a few really important issues at a time in order to effectively communicate the priorities to the people involved in the information management activity. If only the topics with major importance will be articulated as the major information targets, they will be likely to become a part of the active memory of the organisation enabling the key individuals to be continuously aware of the external factors they are supposed to track. By prioritising, it is possible for a company to avoid focusing on information wants instead of more essential information needs. Concerning competitors, there is much evidence suggesting that it is more effective to concentrate on extensive and in-depth information on one particular company with a specific goal in mind rather than continuously monitoring a whole array of rivals. (Bernhardt, 1994; Ghoshal & Kim, 1987)

4.8. Framework for Analysing Business Information Needs in an Internationally Operating Company

Models and guidelines for analysing business information needs in companies were covered in chapters 4.4. and 4.5. being primarily based on academic discussion as well as company and consultant experiences. The aim of this chapter is to build a comprehensive and applicable framework for analysing business information needs in an internationally operating company that is planning to develop its business information management activities in a need-based way. This is done based on the previous discussion and conclusions drawn from it.

4.8.1. Conclusions and Criticism of the Existing Models and Guidelines

Generally, there is very little information on how effective the previously discussed models have been in analysing the real business information needs in companies. This kind of effectiveness is extremely difficult to measure as is the value of information in general. We can draw the basic conclusion, however, that these models have been accepted and not much criticism has been presented on their usage, even though some general problems in analysis were highlighted in chapter 4.6. This lack of extensive criticism, however, seems to be very much based on the poor knowledge of information needs in general and their analysis more specifically.

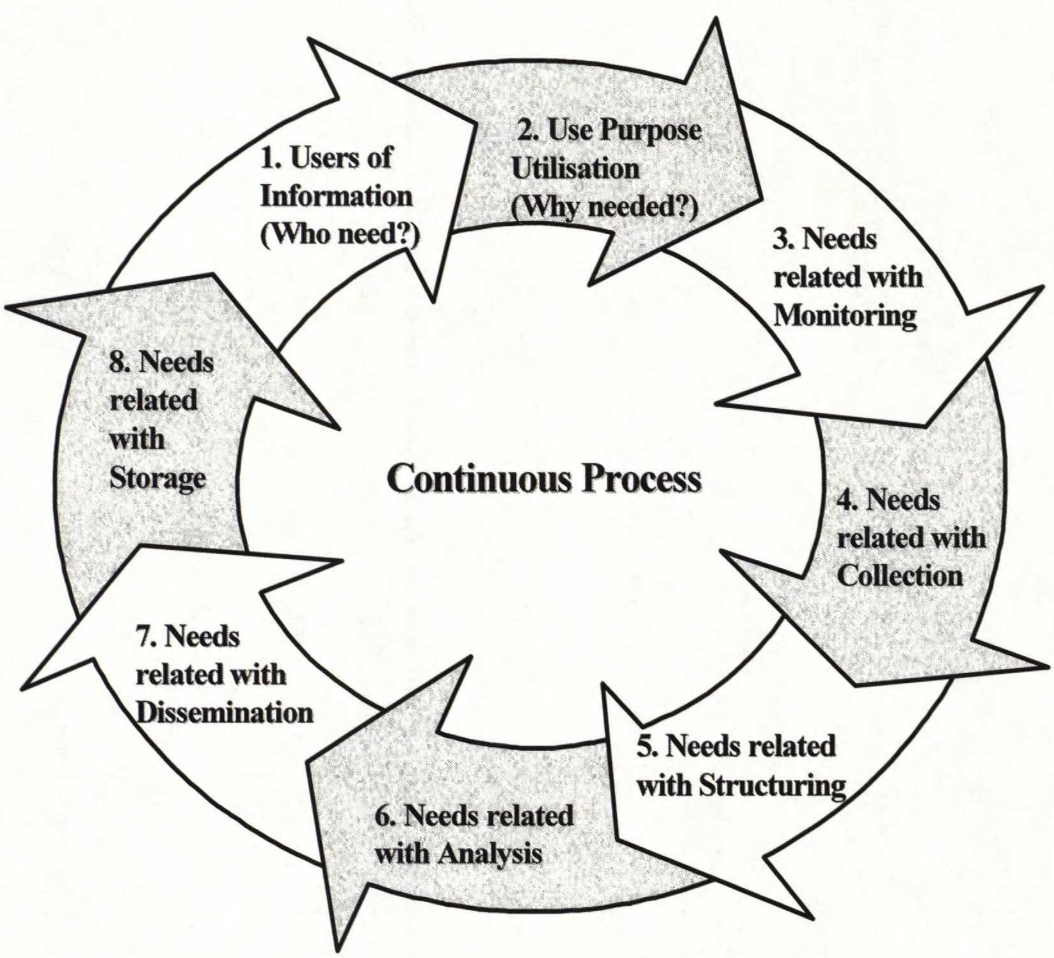
Taken into account the dimensions of business information need which were presented in chapter 3.2. and further dealt with in the consecutive chapters, we can draw the conclusion that the current models are not comprehensive enough in the sense that they do not take into account all the dimensions of business information needs. Most of the existing models are suitable for analysing what information types are needed, but can not be used for examining business information needs on the whole when developing a business information management system. Most frequently the existing models do not take into account the needs related to analysis, dissemination and storage of information. Moreover, the evolving nature of information needs is taken into account in very few models discussed earlier and also the difference in the needs of various organisational levels is handled in a limited way. On the other hand, many elements of the information needs have been dealt with very thoroughly in existing models, which gives a good basis for developing a new model as some parts can be adapted directly to the new model.

4.8.2. Analysing Business Information Needs - Information Cycle Approach

The developed model here is strongly influenced by Calof (1997) who has suggested articulating the business information needs into a business information management cycle, which is often referred as a business intelligence cycle. Consequently, this model developed in this Thesis is named as the "Information Cycle Approach".

The core of the Information Cycle Approach is the Business Information Need Cycle (see figure 18), which is further developed from the business intelligence cycle presented by Virtanen (1998, 33). In this cycle, the various dimensions of the business information needs, which were presented in chapter 3.2., are illustrated based on the phases of managing business information flows in the company.

Figure 18. Business Information Need Cycle



The Information Cycle Approach is not dependent on who the analyst is or who are forming the analyst team. In order to achieve high-quality results it is, however, suggested that this model is exploited by combining in-house expertise and external expertise as has been suggested by Finne (1996, 73). In this way, both the neutrality aspect as well as the organisational knowledge will be represented.

The cornerstone of this model is the fact that it **takes into account both the organisational and individual business information needs and covers all the elements of business information need**. Methods to be used in the Information Cycle Approach include **brainstorming**, which can take place in focus group discussions and workshops, **personal interviews** and **surveys**. Consequently, this model quite strongly follows the use of methods suggested by Hedin (1998). Furthermore, **checklists** and **previous experience** can be used as supportive methods especially in the brainstorming stage.

In the Information Cycle Approach, the analysis process is divided into three phases depending on the analysis method:

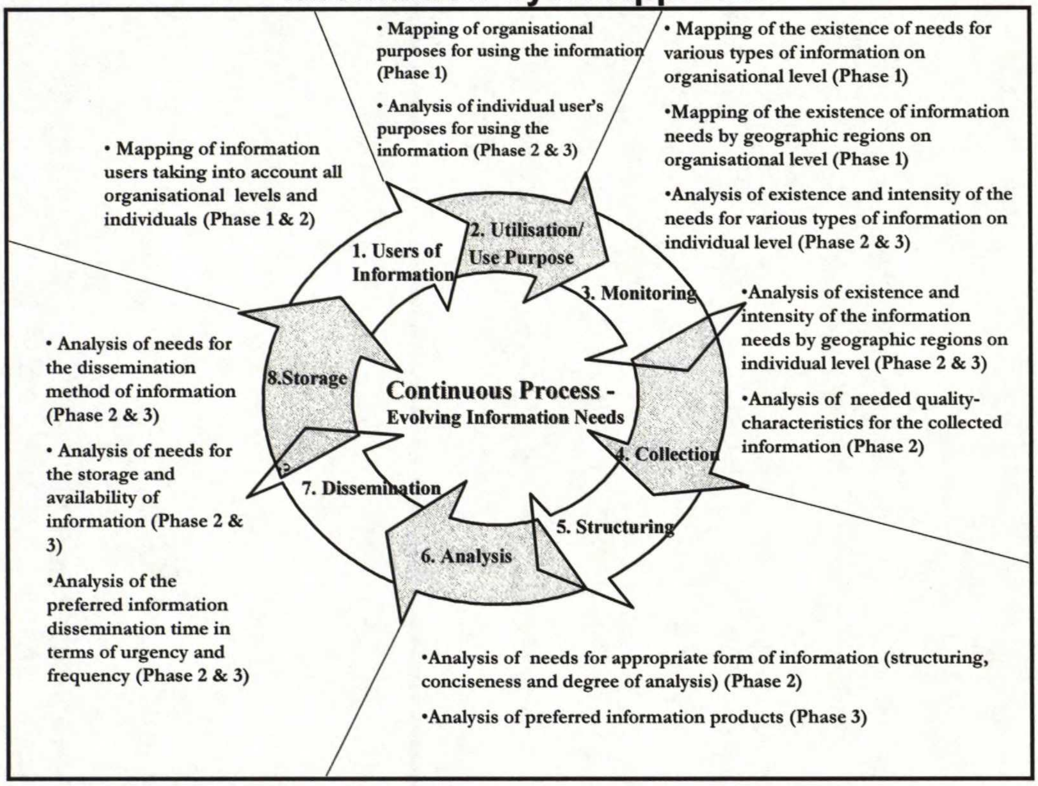
- Phase 1: Need Mapping on the Organisational Level by Brainstorming
- Phase 2: Need Analysis on the Individual Level by Personal Interview
- Phase 3: Need Analysis on the Individual Level by Survey

It is important to note, however, that the previous methods and phases can be used in a creative way and not all methods are necessarily to be used when analysing the needs in one specific company.

The Information Cycle Approach for analysing business information needs is illustrated in the next figure 19 presenting the contents of the model in more detail. First of all, it takes into account the analysis of the various dimensions of business information needs. These dimensions are linked with the specific phase of business information management cycle where the needs should have influence on the actions. For this reason, some phases of the cycle which are in connection with the same needs have been grouped in the following figure. In the information monitoring and collection phases, for example, one has to know: i) what types of information are needed?, ii) from which geographical market-area information is needed?, and iii) what are the quality requirements for the needed information? Similarly, regarding the information dissemination and storage phases, one has to know: i) the specific needs on which dissemination and storage methods are preferred, and ii) when the information is needed?

Secondly, the following illustration of the model (see figure 19) includes an indication of the analysis method to be used by indicating the phase of the analysis process where the specific dimension of the need is to be covered. Phase 1 is concentrated on mapping information needs on the organisational level and thus creating a basis for the next phases where the analysis is done more specifically on individual level. As the nature of analysis during this phase 1 is not very detailed this part of analysis is called as mapping of the organisational information needs. The phases 2 and 3, on the other hand, are focusing on analysing individual business information needs in a more detailed approach by the use of personal interviews (phase 2) and a survey (phase 3).

Figure 19. Analysing Business Information Needs - Information Cycle Approach



Thirdly, the dimension of evolving business information needs is illustrated in the core of the figure 19. As management of business information is a continuous process, also the analysis of information needs has to be done continuously or at least periodically. This on-going process of reviewing information needs should be incorporated as part of an on-going business information development programme as has been highlighted by Wilson (1997, 208). Instead of only being a formal procedure, this can be done by more informal discussions as suggested by Virtanen (1998, 107-109).

4.8.3. Information Cycle Approach by Phases

In this chapter, the three phases of the Information Cycle Approach are presented in more detail including the contents, method and objectives for each phase.

Phase 1: Need Mapping on the Organisational Level (Brainstorming)

- **Contents:** The phase 1 includes need mapping regarding the business information needs from an organisational point of view. This phase involves the following steps: i) mapping of organisational purposes for using the information, ii) mapping of the business information users and providers in the company, iii) selection of the target group to be included in the personal information need analysis by interviews and/or surveys, iv) mapping and categorisation of the existence of the needs for various types of information, and v) mapping and categorisation of the existence of business information needs by geographic regions.

- **Method:** The first step (i) has to be based on the overall purpose of the need analysis, which can be deepened in a brainstorming session. It is of utmost importance that the results of this step are approved by the top-management. The following two steps (ii and iii) can be done in brainstorming sessions between the need analyst and a representative of the company such as a business intelligence manager or a director with extensive background in the company. The mapping of the existence of the needs for various types of information as well as the mapping of existence of the business information needs by geographic regions are preferred to be done in focus group discussions involving information users in the organisation and possibly information providers within the company, so that the total number of people involved would be from 4-10. These people should be chosen from the target group for the business information system under development and can thus include information users from the strategic as well as operative level. Often, it is extremely difficult to find this kind of common time in today's hectic business conditions, and, consequently, this phase can be done by a smaller group as well. In this case, however, the experience of the participants has to be extensive within the organisation and regarding the role of business information in the organisational level. In practice, the analysis of the existence of the needs for various types of information is done by first assessing the company's business objectives that are planned to be reached within a certain amount of time, which typically is set at 3-10 years depending on the company. This is then followed by an assessment of critical success factors for the company which can be used as a basis for building a list of information types needed in the organisation on the whole, and making categorisation of these identified information types.

➢ **Objectives and Outcome:** The main objective of this phase is to create a basis for the second and third phase of the analysis of business information needs. This will first of all be done by starting to create an "Information User & Provider Map", which can be used as a basis for choosing the target group for the next phases of the need analysis i.e. the personal interviews and the survey. Secondly, an outcome of this phase should be a categorisation of business information types and geographic market areas, which can be used in the next phases of the need analysis with an aim to test these initial categories and to go deeper into detailed types of needed business information.

➢ **Questions per Step:**

1. What are the organisational purposes for using business information?

2. Who are the users and providers of international business information within the organisation?

   – Levels to Be Taken into Account:

     1. Group level: headquarters
     2. Division/Business Group level
     3. Strategic Business Area & Strategic Business Unit Level
     4. Regional level: regional headquarters
     5. Country level: country branch
     6. Functional levels in the previous stages:
        - Strategic planning
        - Marketing
        - Export/International Operations
        - Research & Development
        - Production
        - Finance
        - Information Technology
        - Logistics

7. Team level
8. Individual level

3. Who of the users and providers are the target group for the business information need analysis on individual level?

4. Mapping and categorisation of the existence of the needs for various types of information:
   - What are the business objectives of the company within a specified time (3-10 years)?
   - What are the critical success factors (CSF) for the company's success within the specified time (3-10 years)?
   - What types of information are needed in order to strengthen the company's position in terms of critical success factors and thus the business objectives?

5. Which geographical market-areas are the focal points of the information need within the specified time (3-10 years) and how should these areas be categorised?

Phase 2: Need Analysis on the Individual Level (Personal Interview)

- **Contents:** The phase 2 includes the analysis of individual business information needs regarding the whole business information cycle and all the dimensions of information need. This phase involves the following five steps: i) formulation of a company-specific interview structure based on the interview elements of phase 2 (see figure 19 and the list below), ii) test interviews, iii) actual interviews, iv) analysis of the interviews, and v) visualisation of the results.

- **Method:** A personal interview (face-to-face or telephone) based on pre-formulated open questions.

- **Objectives and Outcome:** Identification of the individual information needs within the company and a summary of the information needs of the organisation in general.

➢ **Interview Elements:**

1. Mapping of information users
    a) Personal positioning of the interviewee in the "Information User & Provider Map"
    b) Other people to be included in the "Information User & Provider Map"

2. Analysis of personal purposes for using the information
    a) Personal job responsibilities (in order to get deeper insight of the use purposes)
    b) Personal purposes for using the information

3. Analysis of existence of the personal needs for various types of information
    a) What information does the information user need to do his job effectively?
    b) What types of information does the information user need within the company-specific information categories that were identified in the phase 1?

4. Analysis of existence of the personal needs by geographic regions
    a) Is the information need: a) global, b) regional or c) country-based?
    b) From which geographical market areas information is needed?
    c) Differences in what information is needed globally, regionally and on country-basis?

5. Analysis of needed quality-characteristics for the information

6. Analysis of needs for appropriate form of information
    a) How structured, concise and analysed should the information be when disseminated to you?
    b) Are there some certain information products that you need?

7. Analysis of needs for various dissemination methods of information

8. Analysis of the preferred information dissemination time in terms of urgency and frequency

9. Analysis of needs for the storage of information

Phase 3: Need Analysis on the Individual Level (Survey)

- **Contents:** The phase 3 includes the analysis of individual business information needs regarding most elements of the business information cycle and the dimensions of information need. This phase involves the following five steps: i) formulation of a company-specific survey based on the survey elements of phase 3 (see figure 19 and the list below), ii) test surveys, iii) actual implementation of surveys, iv) analysis of the surveys, and v) visualisation of the results.

- **Method:** A formulated survey that can be received and returned by email, mail or fax. The questions are structured and not open-ended. The survey is preferred to be done after the personal interview so that the responses in the interview would be impulsive. It is, however, possible to conduct the survey also before or during the interview.

- **Objectives and Outcome:** Measurement of the quantifiable individual information needs within the company and a summary of the information needs of the organisation on average. A presentation of information gaps regarding information types and geographical areas as suggested by Hedin (1998) and presented in figure 7.

- **Survey Elements:**

  1. Organisational location of the respondent in terms of strategic and operative position

  2. Analysis of personal purposes for using the information by evaluating the importance of the factors mapped during phase 1

3. Analysis of the intensity of the needs for various types of information by evaluating the importance of the information types mapped during phase 1

4. Analysis of satisfaction regarding the current supply of information types mapped during phase 1

5. Analysis of the intensity of the information needs by geographical regions by evaluating the importance of the geographical regions mapped during phase 1

6. Analysis of satisfaction regarding the current supply of information regarding the geographical regions mapped during phase 1

7. Analysis of preferred information products by evaluating the importance of listed information products that may be based on existing information products within the company as well as on information products known to be useful in other organisations.
8. Analysis of needs for various dissemination methods of information by evaluating the importance of listed dissemination methods that may be based on existing methods within the company as well as on methods known to be useful in other organisations.
9. Analysis of the preferred information dissemination time in terms of urgency and frequency by evaluating the importance of listed time-frames.
10. Analysis of needs for the storage of information by evaluating the importance of listed storage approaches that may be based on existing approaches within the company as well as on approaches known to be useful in other organisations.

5. Analysing Business Information Needs in the Case Company

5.1. Methodology

When a research strategy was chosen for this study, it was obvious that a purely theoretical approach would not have been rewarding. As the principal objective of this study is to develop a comprehensive model to be applied to internationally operating companies, the results would not have much relevance without empirical analyses. Moreover, the Thesis would not contribute much to the previous discussion, if there would just be a theoretical framework.

It was likewise clear that a quantitative approach, such as a highly structured questionnaire or a recorded experiment in various companies, would not be suitable for the research in question, as the empirical study should serve as an experimental testing field for the newly developed model rather than produce large number of quantitative data with statistical significance. In this rather untapped field, it is more valuable to create some basic understanding of how things may work, than to collect superficial quantitative data without having any tools for assessing its implications. Thus, the methodology to be used in the empirical part needed to be a qualitative one rather than a quantitative one.

When considering various qualitative study methods, such as focus group discussions, theme interviews and a case study, a case study clearly seemed to be the most suitable in addressing the needed testing characteristics, in spite of some possible drawbacks of the method. As Eisenhardt (1989, 532) puts it, case studies are commonly considered an appropriate research strategy especially for new topic areas, where collection and analysis of qualitative data is necessary and where through a profound understanding of single cases even a new generalisable theory could be built. Moreover, according to Yin (1994, 39), case study is preferred in situations, when "how" and "why" questions are being posed, when the investigator has little control over events and when the focus of the research is on a contemporary phenomenon within some real-life context.

Case studies have mainly been criticised in the sense that they result in massive, unreadable documents. This, however, is not a fault of the method, but rather caused by the inability of the researcher to complete his work: as the data collected during the case research is qualitative and very unstructured, drawing conclusions from it requires a great deal of time, evaluation, further clarification from the interviewees and theoretical background information about the subject. Therefore, in case studies there is a temptation to just report the data and let the reader make his own conclusions. This, however, results in the above mentioned massive documents, and lowers value of the work if no explicit conclusions are stated. (Yin 1989, 21)

As for the generalisability of the results of this research, the implicit assumption of case research is that it is not generalisable. This does not, however, reduce the value of case research, because the results of one case research give a good basis for other researchers to investigate whether the same reasoning applies for other cases as well. In this way generalisable theories may evolve. The aim of the case study is to be generalisable to theoretical propositions, not to populations or universes, thus expanding and generalising theories, not enumerating frequencies. (Yin 1989, 21)

As a conclusion, it can be said that cases are especially suitable for research that aims to generate new information out of qualitative material on a previously rather uninvestigated field of research. Thus, case study as a methodology is well applicable for the purpose of this study and was thus chosen to be used in the empirical part of this study.

Stake (1994, 236-247) distinguishes three different types of case studies: intrinsic, instrumental and collective. Intrinsic case study refers to a study that has been undertaken because better understanding of a particular case is wanted. The case is not supposed to represent other objects but illustrate a certain trait or problem. It is the particular case as such, which is interesting enough to be explored.

In instrumental case studies, a particular case is examined in order to provide insight into an issue of refinement of a theory. In fact, the case is argued to be of secondary interest playing a supportive role facilitating understanding of something else. Typically, the case is looked at in depth with detailed activity descriptions. It may be considered typical of other cases or not. The aim of an instrumental case study is to facilitate understanding of the primary interest. (Stake 1994, 236-247)

With less interest in one particular case, it is typical to choose collective case study method. A number of cases are jointly examined in order to understand a general condition of a phenomenon. Generalisations are sought for by extending an instrumental case study to several cases. (Stake 1994, 236-247)

According to Stakes's (1994, 236-247) categorisation, an instrumental case was identified as the most suitable case study for the purpose of this Thesis, as the particular case is examined in order to provide insight into an issue of refinement of a developed model. Moreover, the case is of secondary interest playing a supportive role facilitating understanding of something else, and aims at facilitating understanding of the primary interest. (Stake 1994, 236-247)

It would have been possible to choose a collective case study method as well, in which a number of cases are jointly examined in order to understand a general condition of a phenomenon (Stake 1994, 236-247). The time and costs for taking such an effort, however, would have been too enormous for a Master's Thesis as it would have demanded approximately 4-6 months work in each company. In addition, questions connected with business information are usually burdened with confidentiality in a corporate organisation and a larger sample would obviously have been difficult to obtain.

Yin (1989, 50) claims the use of a single case study justifiable when the case represents a critical test for an existing theory, when the case is unique or rare event or where the case serves a revelatory purpose. In this Thesis, the case study can be seen to represent a critical test for a developed theory, and thus the use of a single study can be seen as justified

In this Thesis, the case study is used for experimental testing of the model, which was conceptually created in chapter 4.8. based on previous discussion and conclusions drawn from it. The developed business information need analysis model is, first of all, adapted to the case company, which is documented in chapter 5.3. After this, a business information need analysis is conducted in practice according to the adapted model. In the actual analysis, the primary methods are brainstorming discussions, face-to-face interviews and a survey, which will be examined more thoroughly in chapters 5.4.-5.6. A summary of the findings of the case study are presented in chapter 5.7., after which the further developed model for analysing business information needs is presented in chapter 6.1.

The aim of the case is to test the validity of the developed model and bring up new aspects for its further development, related to theoretical discussion presented.

According to Huberman and Miles (1994, 428-444) this type of approach can be called following the surprises in the analysis process.

There were several criteria when selecting the case company in order to fill the purposes of this study. First, the company was determined to have extensive international operations. Second, the company was determined to show considerable need and interest in developing its business information management procedures, and be thus committed for supporting the case study. Thirdly, the company was determined to be relatively big, so that the needs would be heterogeneous. Finally, it would make the case much more interesting if the field where the company is operating would be dynamic and the needs thus rapidly changing.

The case company in this study was *NKF Holding N.V.*, which fulfilled all the criteria. The ultimate unit of analysis in *NKF Holding N.V.* was the Business Group Communication Networks as a whole and also various organisational strategic business units inside the company were studied. A company in the communication networks industry was considered an especially interesting unit of study, because in this industry the business environment is perhaps the most turbulent of all industries, and consequently the business information needs are very broad and evolving rapidly. Moreover, the extensive international operations of the company and its large as well as heterogeneous organisation provided a very demanding and challenging test field for a case study with such a comprehensive approach. The case company is presented in the following chapter 5.2.

The data collection of the study was, first of all, done by observing the whole process of analysing business information needs in the case company. The extensive interaction with the company representatives allowed the observation of respondents' reactions in the various phases of the study. Secondly, observations as well as the identified needs were documented throughout the data collection process. Finally, data was collected based on the specific feedback received from the case company.

The data analysis phase in the present study was time consuming given the large amount of empirical data in terms of business information needs to be analysed. Even though, the data analysis for this Thesis was actually analysis of the need analysis process, the results of the process, i.e. identified business information needs, had to be evaluated as well in order to form an understanding about the validity of the model. Analysis of the phases of the need analysis process have been presented separately in chapters 5.3.-5.6., and so these chapter include information on the number and duration of conducted interviews as well as on other relevant issues at that stage. Moreover, a summary of the data analysis is presented in chapter 5.7. along with the major findings.

In order to avoid the typical problem of case studies, i.e. massive documents with no conclusions, the clarification for the empirical part of this study in chapters 5.3.-5.6. has been kept as very concise and conclusions have been added in the end of each chapter.

5.2. Introduction to the Case Company: NKF Holding N.V.

NKF Holding N.V. is an international group of companies supplying cable products, cable systems, accessories and services to energy and communication networks and for other applications. The headquarters of the company are in Delft, the Netherlands, and the company is listed on the Amsterdam Exchanges. In 1998, the largest owners are *Flint Holding N.V.* (10%), *Pascom* (9%), *AEGON N.V.* (9%), *ABN AMRO Holding N.V.* (6%) and *Rapobank* (5%).

The group has industrial facilities in Finland (Oulu, Pikkala, and Vantaa), the Netherlands (Delft and Delfzijl), Germany (Nuremberg, Köln and Berlin), Russia (St. Petersburg and Moscow), Estonia (Keila) and China (Shanghai). In addition to the offices and production facilities in these countries, *NKF*'s companies have regional offices and project coordination centres in more than 15 countries all over the world.

Product Range

The group's product range includes cables and related components for public and industrial energy networks from 1 to 400 kilovolts, for public and private telecommunication networks (optical fibre as well as metallic cable networks), for data- and multimedia networks and for wiring systems in buildings and ships. The range of specialised services provided by the group covers the entire field of network design, network realisation (on turnkey basis or otherwise) and network maintenance and management.

Performance

The turnover of *NKF Holding N.V.* in 1997 was NLG 1376 million, which in July 1998 was equivalent to approximately FIM 3715 million. In the same year the company recorded a 1.4 percent return of equity with a net profit of NLG 6.2 million compared to net profit of NLG 53.3 million in 1996.

The three domestic market areas, the Netherlands (19% of sales), Germany (18%) and Finland (18%) accounted for altogether 55 percent of the group sales, and an additional 22 percent of total sales was exported to the rest of Europe. Far East accounted for 14 percent of sales, whereas the share of Americas (4%), Middle East (3%) and Africa (2%) were considerably smaller.

The number of personnel in the beginning of 1998 amounted to 2275, of which 838 were in the Netherlands, 292 in Germany and 1145 in Finland. Moreover, the *NKF* group has a large number of employees in various joint ventures such as *Kaiser KWO Kabel* in Germany where more than 700 people are employed.

Strategy

NKF Holding N.V.'s strategy focuses on increasing its competitive strength and the shareholder value of the group, and emphasises two key elements. On the one hand, the efficiency of operations is continuously improved, leading to an excellent cost position. This efficiency allows *NKF* to operate profitably in the most competitive markets, in which the effects of deregulation and privatisation of the communication industry and of the energy supply and distribution sector are most advanced.

The second leg of *NKF*'s strategy is to increasingly develop and market services and sophisticated products with higher added value to customers, providing them with solutions for their changing needs as network operators and/or service providers. The development of these new services and products focuses on growth markets which offer clear opportunities to differentiate between suppliers by the quality and innovative strength of the solutions provided to these customers. The main areas for the development of new products and services in the communication networks market are the business arenas for optical and hybrid communication systems, (private) networks for data and video communication, and cellular cable systems for mobile telecommunication networks. In the world of energy transmission and -distribution the company is mainly focusing on growth and expansion of high voltage systems business.

The group will only continue its other businesses in those markets, where the profitability and/or cash flow criteria are met, which have been defined for each of these businesses. By concentrating on operational and capital efficiency for activities in no-growth areas, the company ensures a good cash flow, which allows for investing in the growth areas mentioned before.

These strategic directions for the group as a whole have been translated into specific targets for the different strategic business areas, focusing on profitability, on growth and/or on cash flow. For *NKF Holding N.V.* the long term targets for profitability and growth are set as 15 percent Return On Net Assets (RONA) and an average annual increase of earnings per share of 10 percent.

While implementing this strategy, *NKF Holding N.V.* aims at establishing partnerships with customers, with suppliers of network components and occasionally even with competitors, when it is an appropriate step to take for a specific business in a specific market. This latter option has been demonstrated in the solution for the structural problems encountered in the German market for low- and medium voltage cables during the early 1997. In combination with the competencies built by the group as a whole, these partnerships enable *NKF* to offer its customers innovative and/or cost efficient solutions for their networks.

Also within its international organisation *NKF* focuses on partnerships: between units and companies as well as between people. These partnerships enable all companies and units to utilise the available know-how and resources and to offer the full range of products and services through all outlets.

Legal Organisation Structure

The legal structure of the *NKF* group in January 1998 is presented in the following figure 20. *NKF Holding N.V.* is the company holding the *NKF* group of companies. The main activities of *NKF Holding N.V.* include group-level management, finance, controlling and external communications.

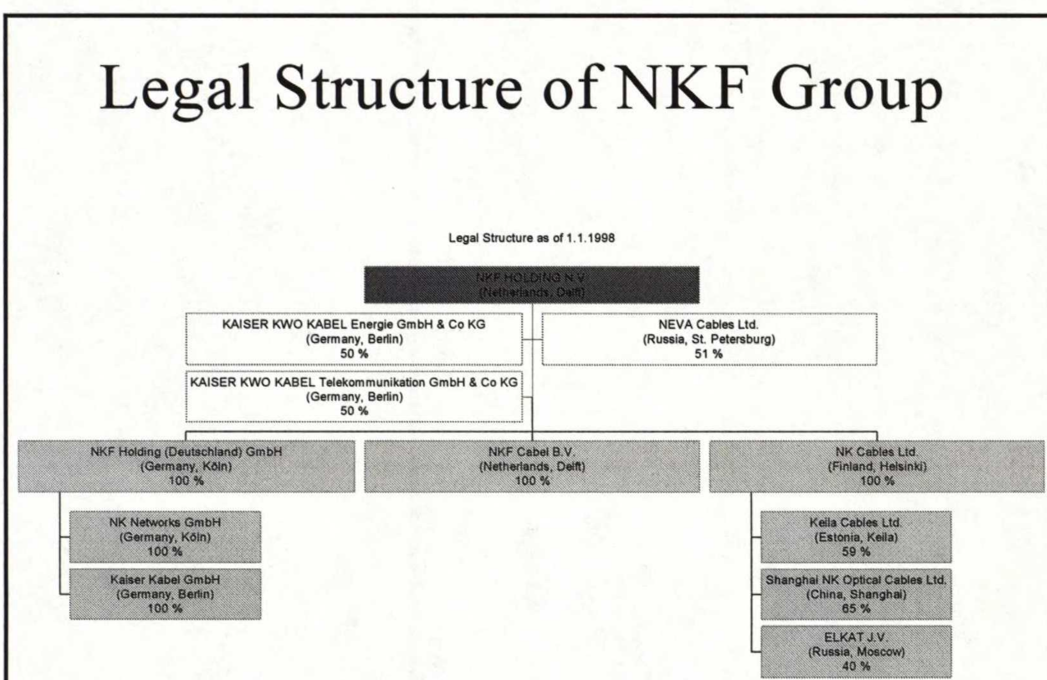
The group presently comprises three operating companies:

- *NK Cables Ltd.* in Finland (Espoo, Kirkkonummi, Oulu and Vantaa)
- *NKF Kabel B.V.* in the Netherlands (Delft and Delfzijl)
- *NK Networks GmbH* in Germany (Cologne and Nuremburg)

In addition to the facilities in the three domestic markets, the companies in the group have regional offices and project co-ordination centres in over 15 countries all over the world including United States, United Kingdom, Spain, Turkey and Netherlands Antilles. The group also comprises the following subsidiaries and participating interests: *KEILA Cables Ltd.*, Estonia (59%); *NEVA Cables Ltd.*, Russia (51%); *SHANGHAI NK Optical Cables Ltd.*, China (65%) and *ELKAT J.V.*, Russia (40%). Moreover, in the spring of 1999, the joint venture *Algar-NK Integracao Optica* will start production operations in Brazil.

Since October 1997, the energy and metallic telecom cable businesses of *NKF Holding N.V.* in Germany have been integrated into two joint ventures that have been established together with *BICC Group plc*: *KAISER KWO KABEL Energie GmbH & Co KG* and *KAISER KWO KABEL Telekommunikation GmbH & Co.*

Figure 20. Legal Structure of NKF Group



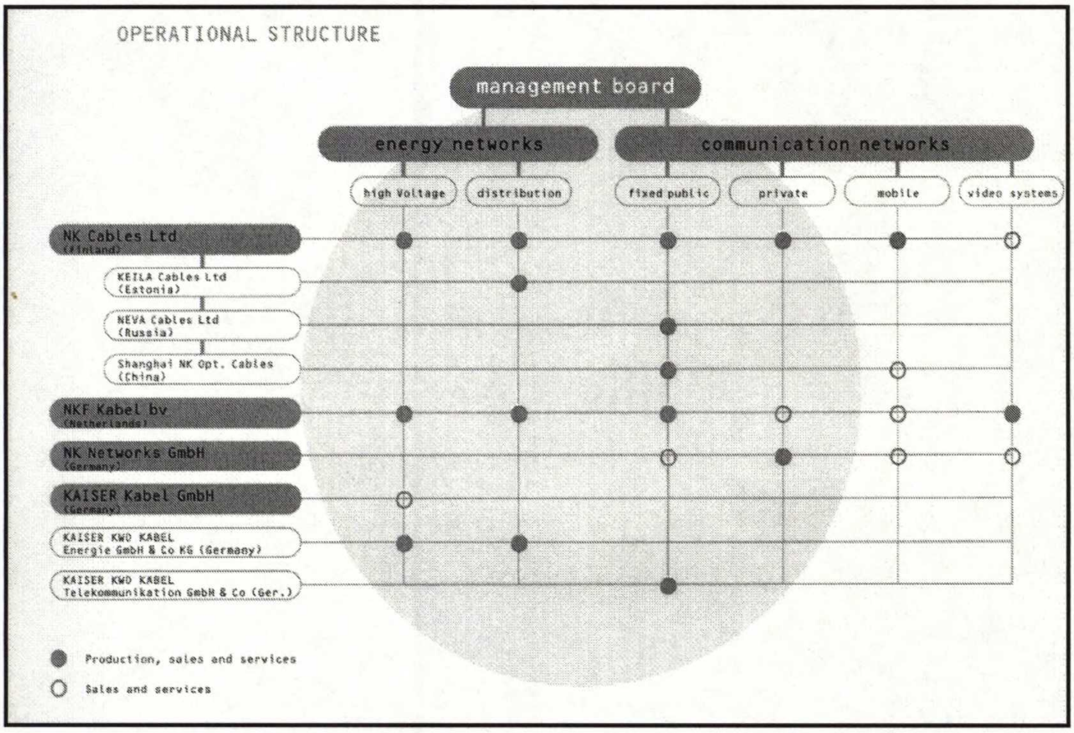
Source: NKF Annual Report 1998, 6

Operational Organisation Structure

As from January 1998, the companies of *NKF Holding N.V.* operate and co-operate in a matrix structure. Strategic management of all units and international co-operation is ensured through the Strategic Business Areas in which the Strategic Business Units in the different countries are united. Management of the day-to-day operations is organised within *NKF*'s companies, maintaining the short and direct lines of communication with the customers.

The operations of *NKF* group have been organised into two international business groups: Energy Networks and Communication Networks. These business groups are further sub-divided into six Strategic Business Areas (SBAs), which are presented in the following figure 21.

Figure 21. Operational Structure of NKF Group



Source: NKF Annual Report 1998, 7

The Business Group Communication Networks being the core of this study is presented in more detail in the following paragraphs.

The Business Group Communication Networks

The Business Group Communication Networks with its main offices in Espoo (Finland), Delft (Netherlands) and Cologne (Germany) and production facilities in Oulu and Vantaa (Finland), Delfzilj (Netherlands) and Nuremburg (Germany) manufactures and supplies a wide range of communication cables, cable systems and specialised services. Communication Networks also builds public and private (tele)communication networks on a project basis in countries all over the world.

Communication Networks further comprises a cellular networks cable unit in Oulu, which develops, produces and supplies antenna cables for mobile telecom networks, a LAN/WAN Business Centre in Cologne, which supplies, installs, and maintains Local and Wide Area Networks and an optical fibre unit in Vantaa. Also included in the business group is a Video Systems unit in Delft, which develops, produces and supplies high-grade transmission systems for video-, data- and audio signals.

In 1997, the sales of Communication Networks totalled NLG 732 million (FIM 1977 million) making 53.2 percent of the *NKF* group's sales. On a comparable basis net sales from ongoing activities grew with 6.4 percent. In the final quarter of 1997, the monetary and economic crisis in Asia was reflected in a general drop of demand for cables in this region.

5.3. Adapting the Need Analysis Model to the Case Company

The adaptation of the need analysis model has to take into account the specific circumstances of the company. In this respect, especially the ultimate purpose for the need analysis becomes important, i.e. why business information needs will be analysed in the first place? Another major issue is the scope of the purpose. It definitely makes a difference, whether the need analysis model will be adapted for the purpose of analysing needs for further developing existing competitor information system in one particular country or whether the aim is to build a global business intelligence system totally from scratch. Thirdly, the size of the target unit in terms of personnel and the extensiveness of international operations are additional elements which need to be taken into account. On the whole, there needs to be lot of "high touch" when adapting the model as there might be very company-specific factors, which have an influence on the adaptation of the need analysis model.

The management of the case company, i.e. Business Group Communication Networks of *NKF Holding N.V.*, recognised a strong need for a systematic Business Intelligence programme in early 1998. This was primarily a result of the newly developed strategy, which is based on two cornerstones. First, the efficiency of operations should be continuously improved, leading to an excellent cost position. Second, the company should increasingly develop and market services and sophisticated products with higher added value to customers, providing them with solutions for their changing needs as network operators and/or service providers. As *NKF* is traditionally a company supplying cables, this latter factor takes the company into a totally new business environment with various positions along the networks value chain. As a result of the aim to move into a partly new business environment, the needs for business information expanded to a totally new scope, and the management of this information with a systematic approach, i.e. Business Intelligence, was seen as a necessity.

During summer of 1998, initial objectives for the Business Intelligence programme in the case company were set. First, Business Intelligence should provide the strategic management with the needed actionable intelligence on the external operating environment (competitors, customers, networks industry and markets) constantly to be exploited in strategy formulation and decision making. Thus, Business Intelligence and strategy formulation process should be closely linked together.

Secondly, the BI-programme should serve the tactical and operational levels as well, and thus has to be linked straight to the business. In the case company, these levels are anyway very closely attached to each other as the same managers are doing strategic plans as well as tactical and even operational decisions within the streamlined organisation. Moreover, as a third objective, the BI-process should enhance the overall objectives of the *NKF* group in terms of management development and investing in the competence of people.

Regarding the building of a Business Intelligence programme, a large need was realised for determining the business information needs for couple of reasons. First, as it was mentioned, the company is expanding its operations into a new service-oriented business environment, and, thus, there was no existing clarification of needed business information types in this new environment. Thus, the need analysis was seen as a tool for facilitating strategic planning in the case company. Secondly, based on experiences from other companies it was identified that it would be too risky effort to start building a Business Intelligence programme without clearly defined needs and priorities regarding e.g. the dissemination method and needed form of information. Thirdly, as the case company has major operations in three countries (Finland, the Netherlands, Germany) and production facilities as well as sales operations in several continents, it was considered important to commit the future users and contributors of Business Intelligence to this group-wide activity by letting them express their needs and then taking them into account in the programme design phase.

On the whole, the situation in the case company reflected well the need for analysing business information needs in terms of various dimensions and not only regarding the needed types of information i.e. the information content. Thus, it can be concluded, that the starting situation in the case company was very suitable for testing the Information Cycle Approach in order to analyse business information needs with a comprehensive approach.

The actual adaptation of the Information Cycle Approach in the case company was started by choosing the analyst team, which was primarily done by the chief executive of Business Group Communication Networks. In this case, the analysis team was formed by two people with a combination of in-house expertise and external expertise. This kind of approach goes along with the one suggested by Finne (1996, 73) and brought up in the Information Cycle Approach as well (see chapter 4.8.1.).

For the case company, it was quite natural that an external researcher was chosen to be the primary need analyst responsible for the actual design and implementation of the analysis due to the neutral point of view that he would bring to the analysis. Moreover, the human resources within the company were very scarce to be used for the actual implementation of the analysis. Criteria for selecting the specific researcher (i.e. the author) in the team was based on his previous experience in the business information field and a ready-made approach for analysing the business information needs.

From behalf of the company, the manager responsible for marketing strategy development and business intelligence with an extensive background in the company was chosen to complement the analysis team. His main responsibilities in the team were determined as: i) to share his organisational knowledge as well as business environment knowledge with the external researcher, and ii) to be a facilitator of the analysis by creating needed connections within the company and defining resources to be available. Moreover, as responsible for the development of Business Intelligence within the company he was responsible for steering the project on the whole and making sure that the need analysis correspondents to the purposes of the company. As the Business Intelligence project manager he was reporting directly to both the chief executive of Business Group Communication Networks as well as the chief executive of the whole *NKF* Group.

The analysis team was responsible for the further adaptation of the need analysis model. The first step was to familiarise the external researcher with the company in terms of organisation (operative & strategic), products & services, operations, current status of business information management, current status of information technology resources, strategy formulation process as well as external and internal business environment. This was done with the help of existing material such as annual reports, product brochures and internally done analysis papers, and various discussions between the researcher and the BI-project manager. Moreover, some interviews with other managers were arranged to provide additional information.

As the scope of the analysis was defined to be extensive both in terms of contents (business information elements) and coverage (both organisational and individual needs within the whole Business Group Communication Networks), the Information Cycle Approach illustrated in figure 19 was generally adapted as the framework for the need analysis as such. In practice, this first of all, meant that all the three phases of Information Cycle Approach were decided to be included in the need analysis in the respective order. Secondly, in terms of methods, this meant the use of brainstorming, which was determined to take place in focus group discussions and/or workshops, personal interviews, surveys as well as utilising the previous experience when available. Thirdly, needs regarding all the elements of business information were decided to be included. Finally, needs were to be analysed both on organisational level as well as individual level.

The specific adaptation of the model within the three phases is dealt with in the consecutive chapters 5.4.-5.6.

5.4. Conducting the First Phase of the Need Analysis in the Case Company

According to the Information Cycle Approach the phase 1 includes need mapping regarding the business information needs from an organisational point of view. The main objective of this phase was to create a basis for the second and third phase of the analysis of business information needs.

The **first step** in the phase 1 was the mapping of organisational purposes for using the information. This was done in a brainstorming session within the analyst team and strongly based on the identified overall objectives of the Business Intelligence programme to be developed. Thus in organisational terms, use of business information in strategic planning and decision-making was determined as the primary use. Secondly, business information usage in tactical and operational levels was identified as very important, and also the use of business information to develop organisational competence was identified as a purpose. Outside the scope of the Business Intelligence objectives also the monitoring of competitors, customers, suppliers, global market development and market development on country basis were added as more specified organisational use purposes of business information. The results of this first step were then later verified and approved in a top-management meeting of the Business Group Communication Networks.

The second step during the 1 phase was the mapping of business information users and providers within the case company. This was done based on organisational charts as well as brainstorming sessions within the analyst team. The major issue that was discussed in this phase was, whether the mapping should be primarily based on operational structure or strategic structure. It was, however, quite quickly found out that the strategic organisation reflects the business information needs better especially due to the point that the Business Intelligence programme should primarily be linked with strategic planning. Moreover, the information needs can be more easily categorised based on strategic organisation, which reflects the markets in which the strategic units are operating, whereas the operative organisation basically reflects the production operations with no special focus on product markets.

In the case company, the following organisational levels were identified primarily based on the strategic organisation: *NKF* Group level, Business Group

Communication Networks level, Strategic Business Area level, Strategic Business Unit level, Operative Unit level (general management), Operative Unit level (sales & marketing) and Operative Unit level (technology).

When compared to the list of organisational levels (see chapter 4.8.3.) to be taken into account when mapping information users and providers, we can conclude that the regional level and country level were not applicable for *NKF* as there are no regional headquarters and country level is existing merely in terms of production operations. Moreover, team level was only applicable in production operations, which in general terms was not considered as a target group for Business Intelligence. The functional level was partly taken into account within the organisational levels and was meaningful especially on the Business Group Communication Networks level as well as the "Other Functions level per SBU".

The planned outcome of this second step was to create an "Information User & Provider Map", which could be used as a basis for choosing the target group for the next phases of the need analysis i.e. the personal interviews and the survey. In practice, the mapping of users at this stage was simply done so that with the help of organisation charts, the analyst team sorted out individuals which could be considered as being major users of business information due to their job responsibility in terms of decision-making level and function. In this stage, the company knowledge of the BI-project manager was extremely valuable. The names of these selected individuals were then listed under the appropriate organisational level with an indication of their geographical location.

At this stage altogether 101 people were identified as information users and providers in various organisational levels. Of these 101 people, only one was full-time involved with providing business information for others, whereas the others were active both as information users and providers. This list was then to be further completed in the interview-phase of the need analysis.

The third step in the phase 1 was the selection of the target group to be included in the individual information need analysis by interviews and/or surveys, which was done by a brainstorming session within the analyst team. The initial idea was to involve approximately 30 people within the case company with both an interview and a survey. While choosing these people the primary idea was to include key people from all organisational levels that were identified during the first step. Second major objective was to include managers responsible for various functions, i.e. R & D managers, production managers and sales managers, in order to get information on the difference of needs in various functions. Thirdly, as Business Intelligence was a Business Group-wide programme, it was considered very important to get a comprehensive coverage in terms of various strategic business units (SBUs) and geographical location already in the need analysis project. Thus, it was decided that personal interviews would be conducted in all SBUs and at least in Finland, the Netherlands and Germany, which are the core countries in *NKF* organisation.

In practice, the selection of people to be interviewed was started by including all the key directors in the highest organisational levels with strategic management responsibility. When trying to fulfil the other two criteria the number of people to be included increased quickly to more than 60. It was decided then, that in order to make the need analysis comprehensive enough, the number should be considerably higher than 30. The list of people was anyway compressed a little bit from the 60 down to 54 in order to complete the project within reasonable time and budget.

To make the planning of the interviews easier in one specific country, a matrix table of the people in terms of various organisational levels and various geographical locations was prepared. This matrix is presented in the following figure 22 with an indication of the number of people in each matrix-box.

Figure 22. Matrix of the Number of People Selected for the Interview/Survey

	Finland	The Netherlands	Germany	Other locations
NKF Group level	-	*4*	-	-
BGCN level	*2*	*1*	-	-
SBA level	*2*	*1*	*1*	-
SBU level	*1*	*1*	*2*	-
Operative Unit level (General Management)	*6*	*4*	*2*	*2*
Operative Unit level (Sales & Marketing)	*4*	*2*	*3*	*6*
Operative Unit level (Technology)	*8*	-	*2*	-
Total (54)	*23*	*13*	*10*	*8*

Regarding geographical location, where the personal interviews were intended to be conducted, Finland had some extra weight due to practical reasons i.e. the lower costs and easier access for interviewing. Moreover, it was considered that when interviewing e.g. an R & D manager in Finland, some generalisation of business information needs could be made with the respective functions in the Netherlands and Germany.

The **following two steps** were done in brainstorming sessions within the analyst team. A preferential method would have been a focus group discussion with larger number of participants, but the organisation of a lengthy session, where 4-10 people from different countries would be present was practically impossible when considering the already overbooked schedules of the top-managers within the company and the large amount of time spent in strategic working groups. In this case, however, the experience of the analyst team in terms of the organisation and the role of business information in the organisational level was considered as extensive enough for taking these steps and the results were later on verified by other managers.

The **fourth step** was the mapping of the existence of the needs for various types of information. This was done by first assessing the company's business objectives that are planned to be reached within a certain amount of time. In the case company, the time period for evaluating information needs was set at 5 years. This was based on the conclusion that taking into account the turbulence that communication networks industry is facing a time-span of 3 years is generally relevant for long-term planning purposes, but thinking of a Business Intelligence programme the time-perspective has to be a little bit further away, whereas 10 years in the industry was seen as being suitable only for building visions. In this case, altogether five major business objectives were brought up by the BI-project manager being derived from the *NKF* strategy. These objectives and the related business information needs were then discussed in detail.

After discussing the business objectives, general critical success factors (CSFs) for the company to reach these objectives within the next 5 years were identified and discussed. The identification was done based on previously compiled material from critical success factors of various SBUs, of which the issues relevant for the whole Business Group Communication Networks were selected. Additional CSFs were then derived from the previously discussed business objectives. The 22 identified CSFs were then first categorised into four groups (General Factors, Sales & Marketing, Technology and Other Functions) based on the relevant function and then listed on a matrix table, of which some examples are presented in the following figure 23.

In the following brainstorming session, the 22 CSFs in the matrix table were then systematically discussed one by one to identify what types of information are needed in order to strengthen the company's position in terms of the CSF in question. After this identification was done, these information types were placed into general categories covering similar kinds of information types. In this case company, seven categories where established: technology information, communication networks market information, country development information, customer information, competitor information, and supplier information. These categories as well as the information types within these categories were then later on utilised in the following phases of the need analysis.

Figure 23. Matrix of Critical Success Factors and the Related Business Information Needs

Critical Success Factors	Information is needed on:	Information Category
General Factors (5):		
e.g. Better understanding of the business	• technology development in the networks industry • convergence • value chain evolution • service providers	• Technology Information • Networks Market Information
Sales & Marketing (6):		
e.g. Identifying new customers	• liberalisation & privatisation on a country-basis • companies' operations • value-chain development	• Country Development Information • Networks Market information • Company information
Technology (7):		
e.g. Flexibility of meeting various specifications	• process technology • customer needs • regulations	• Technology Information • Networks Market Information • Customer Information
Other Functions (4):		
e.g. Utilising group-scale economies in buying	• suppliers • buying needs within the organisation	• Supplier Information

The final **fifth step** of the phase 1 involved the mapping and categorisation of the existence of business information needs by geographic regions. This was done by examining the current geographical coverage of operations as well as the future focus in terms of expansion. The idea was more to make a categorisation of geographical areas to be used in the survey phase of the analysis rather than already make judgement on the importance of various areas in terms of business information need.

Based on the brainstorming session the geographical market areas were categorised as follows:

- Finland & Baltic States
- The Netherlands
- Germany
- Other EEA-countries (European Union + Norway & Switzerland)
- Central and Eastern Europe
- Russia and CIS-countries
- Middle East
- Africa
- Asia
- Australia and Oceanic
- North America
- Latin America

This categorisation was mostly based on the current organisation of sales operations, but it was also considered whether the market areas should be divided based on customs areas (EU, NAFTA, Mercosur), which seem to have an increasing significance in international operations.

As a **conclusion** of the phase 1, it can be said that the objective of creating a basis for the second and third phase of the analysis of business information needs was met. In addition, this phase did already provide some initial indications of the existence of business information needs based on critical success factors of the company. In terms of concrete outcomes, this phase first of all produced a platform for an "Information User & Provider Map" and determined the people to be involved in the following phases of the study. Secondly, this phase produced a categorisation of needed business information types and already brought up some needed information types, which formed a basis for formulating the survey. Finally, regarding use purposes and geographical market areas, a categorisation was established to be utilised in the survey part of the need analysis as well.

5.5. Conducting the Second Phase of the Need Analysis in the Case Company

According to the Information Cycle Approach the phase 2 includes the analysis of individual business information needs regarding the whole business information cycle and all the dimensions of information need. The objective of this phase was the identification of the individual information needs within the company and a summary of the information needs of the organisation in general.

The **first step** in the phase 2 was the formulation of a company-specific interview structure based on the interview elements from the Information Cycle Approach that are presented in the following list. This was done by the researcher with simply converting the elements into practical questions. All the questions in the interview were open in order not to tie the respondent to a set of preset answers and in order to get out impulsive responses from the respondents.

Interview Elements:

1. Mapping of information users
    a) Personal positioning of the interviewee in the "Information User & Provider Map"
    b) Other people to be included in the "Information User & Provider Map"

2. Analysis of personal purposes for using the information
    a) Personal job responsibilities (in order to get deeper insight of the use purposes)
    b) Personal purposes for using the information

3. Analysis of existence of the personal needs for various types of information
    a) What information does the information user need to do his job effectively?
    b) What types of information does the information user need within the company-specific information categories that were identified in the phase 1?

4. Analysis of existence of the personal needs by geographic regions
    a) Is the information need: a) global, b) regional or c) country-based?
    b) From which geographical market areas information is needed?
    c) Differences in what information is needed globally, regionally and on country-basis?

5. Analysis of needed quality-characteristics for the information

6. Analysis of needs for appropriate form of information
    a) How structured, concise and analysed should the information be when disseminated to you?
    b) Are there some certain information products that you need?

7. Analysis of needs for various dissemination methods of information

8. Analysis of the preferred information dissemination time in terms of urgency and frequency

9. Analysis of needs for the storage of information

The formulated interview structure is attached in the end of this report (see Appendix 1). The only additions to the previous list were made in terms of the information categories that were identified in the phase 1. Thus, regarding the third element, there are more specific questions concerning the information needs on competitors, customers, suppliers, technologies, communication networks market development and country development. Moreover, a question (number 17) was added regarding acute information needs, in order to get some perspective on what kinds of things are going on in the operative level.

After the interview structure was formulated it was tested by interviewing first the BI-project manager and then one sales manager in normal interview circumstances. This **second step** of phase 2 gave positive feedback for the structure in general and based on some specific comments, one question was added regarding the information needs in relation with the 1999 strategic planning process (see question 18 in appendix 1).

The **third step** in the phase 2 was then actually conducting the interviews with the target group specified during the phase 1. Of the 54 intended personal interviews, altogether 50 were actually conducted, of which 45 were face-to-face interviews and 5 were telephone interviews. Of the 45 face-to-face interviews 25 took place in Finland, 11 in Germany, and 9 in the Netherlands. Regarding the 5 telephone interviews, the respondents were positioned in China, Thailand, USA, Mexico, and Russia. The four people that were not able to participate in the interview later on participated in the study by filling the survey.

The duration of the interviews was from one hour to three hours depending on the interest that the interviewee showed towards the topic and the time that was available. On average, the interview took one hour and twenty minutes, and the researcher documented carefully the responses into the empty spaces of the interview paper.

The **fourth step** in phase 2 was the actual analysis of the interviews. In practice this was done together with the **final fifth step,** i.e. visualisation of the results, as the responses regarding one element at a time were first explored and analysed, after which the analysis was directly put into a visualised form. In some cases, the visualised form was actually used as an analysis tool. While conducting these two final steps of the phase 2, conclusions were drawn at the same time about the successfulness of the question in measuring the dimension of the need in question.

The personal interviews provided valuable information about the **information users and providers.** The organisational charts indicating managers had been a good help in the phase 1, but they did not cover all the people in operative positions in the R & D departments, for example. The interviewed managers were, however, mostly able to recognise major information users and providers within their respective organisations. As a consequence, the initial list of 101 people grew by 56 names up to 157.

After these names had been added on the initial list, it was put into a visualised matrix table, which could be called an "Information User & Provider Map". The vertical dimension of this matrix represents the position of the information user in terms of the strategic structure, whereas the horizontal dimension represents the specific function in which the person is operatively active. The "Information User & Provider Map" is partly presented in the following figure 24 with indication of the number of people in each box. Some people are dealing with the products of various SBUs and thus they are placed in wider boxes which extend over multiple SBUs. In the version provided to the case company, these boxes include the names of the people and their geographical location. The basic purpose of this map is to enhance cross-unit (SBA/SBU) as well as cross-functional communication, when people know who are dealing with the same kind of work responsibilities. Furthermore, it gives a good platform for the Business Intelligence by indicating the major customers for the programme.

Figure 24. Business Information User & Provider Map

Scope / *BI-segment*	Multi-SBA Scope	Copper	Optical	Mobile	Datacom	LAN	Video Systems
General Management	*7*		*2*	*1*	*2*	*2*	*1*
		3					
Controlling & Finance	*3*	*1*		*1*	*1*		
					1	*1*	
Sales & Marketing		*22*		*7*	*6*	*1*	*1*
		7					
etc.							

As a conclusion of this first interview element, it can be said that the interviews were very useful in providing additional names of information users and providers. As a suggestion for further improvement, it would help a lot if the information map would be developed in the very beginning. In this way, new names could be easily put directly into the right box, and no additional analysis work would be needed in this way.

The second element, i.e. the analysis of personal **purposes for using the information**, was successful in terms of bringing information about the individual purposes of using the information. The responses were, however, so scattered that no actual unified analysis could be made based on them, and there was no basis for specific visualisation of the results of this interview element. Consequently, these questions did not bring any additional knowledge on purposes for using information in the case company in general. Nevertheless, this information would be very valuable when developing business information flows and products on individually targeted basis. Thus, it might prove to be valuable on longer perspective when Business Intelligence activities are developed. Moreover, these questions seem to be relatively important in the beginning of the interview anyway, as they make the interviewee oriented to the subject.

The analysis of the **existence of the personal needs for various types of information** was by far the biggest element of the interview including altogether 13 questions. The first question of the series (number 6), i.e. what types of business information do you need in order to do your job effectively, could be considered as too general, as many interviewees responded "all possible information" or had difficulties in specifying information types. Thus, this question did not really bring any value-added to the overall analysis.

The following 10 questions (see questions 7-16 in appendix 1) dealt with the respondents' information needs within the company-specific information categories that were identified in the phase 1. These questions brought lot of valuable information for the need analysis in terms of more specified information needs, and these needs where further grouped into bigger entities during the analysis stage. The actual analysis of these questions was very time-consuming as the tables for visualisation were developed only during the analysis phase. Rather than going through all the interviews afterwards it would have been much more efficient to place the information needs directly into ready-made tables already during the interview.

Anyway, during the analysis phase several tables for visualisation were produced being primarily of two types. The first type of tables was used for presenting the specific companies of which information is needed in various SBUs. Consequently, this type of table was used in presenting the results of questions 7, 9, 11, 13 and 14. This type of matrix table is illustrated in the following figure 25 indicating competitors of which information is needed in various SBUs (question 7).

Figure 25. Matrix of Competitors per SBA/SBU

Scope / Competitors	Multi-SBA Scope	Copper	Optical	Mobile	Datacom	LAN	Video Systems
General Description	***Global cable suppliers & network providers***	***Global, regional & local cable suppliers***	***Global, regional & local cable suppliers***	***Global mobile cable suppliers***	***Global cable suppliers & local suppliers***	***Local system inte-grators***	***Very specific regional competi-tors***
Synergy within NKF		*Large*	*Large*	*Little*	***Consi-derable***	***NO***	***NO***
Global competitors	*x*	*x*	*x*	*x*	*x*		
Regional competitors	*x*	*x*	*x*	*x*	*x*		*x*
Local competitors	*x*	*x*	*x*	*x*	*x*	*x*	*x*

The other type of table was used for just presenting types of information under the information categories, i.e. competitors, customers, suppliers, communication networks market and country development. Thus, it was used to present the summaries of the responses to questions 8, 10, 12, 15, and 16. The following figure 26 is an example of this second type of table including the specific information types grouped into larger entities. In this example on the needed types of information on competitors, altogether 36 types of information were identified as being important.

The responses to the questions on acute information needs (question 17) as well as the information needs related with the strategic planning process in 1999 (question 18) were just summarised shortly with no special presentation methods. Actually, the question on acute information needs proved to be quite useless for analysis purposes as there was as many responses as respondents and this kind of information on operative needs is not really valid for developing a Business Intelligence programme as the information need is already outdated when the programme could provide the needed information. The responses to the question on strategic information needs were very general, but these responses give some indication of the need areas which should be tackled first when starting to develop a BI programme.

Figure 26. Needed Information Types on Competitors

Competitor X Information Groupings	Specific Info Types
Gross Indicators	***Total sales*** ***Sales by product group*** ***Market shares*** ***Profit*** ***etc.***
Strategic Issues	***Strategy*** ***Objectives*** ***Organisation*** ***Investments*** ***etc.***
Technology	***Product specifications & characteristics*** ***Product quality*** ***Product price*** ***Processes*** ***etc.***
Operations	***Geographic scope*** ***Production plants*** ***Sales channels*** ***Salesforce*** ***etc.***

The results of the analysis of the **existence of personal needs by geographic regions** were very similar to the analysis of use purposes for the information. The analysis was successful in terms of bringing information about the individual needs, but the responses were so scattered that no general analysis on organisational needs could be made based on them, and there was no basis for specific visualisation of the results of this interview element. Most of the respondents, saw their information need as global and very few of the respondents were able to identify any differences in what information is needed globally, regionally and on country-basis.

The questions in this interview element, however, did bring some rough additional knowledge on the geographical information needs of various SBUs. Moreover, the information on individual needs might prove to be valuable on longer perspective when Business Intelligence activities are developed.

There were lots of similarities in the analysis of the last five interview elements. First, the analysis of the **needed quality-characteristics for the information** as well as the analysis of the **needs for appropriate form of information** were quite similar in the sense that the responses were rather simple and basically unanimous with very little variation in answers. Regarding quality-characteristics of information, the respondents were quite unanimous that also rumours are good to be heard, but they have to be verified before taking any action. Similarly, most respondents preferred to receive information us structured and concise, but the actual analysis should be done by the people themselves. There were very few exceptions to these general trends.

Very few of the respondents were actually able to name any business information products that they would need. This was primarily due to the fact that there have been very limited previous activities in this area within the company. Consequently, this question was not very suitable as an open question at least in the case company.

The analysis of the **needs for various dissemination methods of information** was also rather simple as most people were unanimous on the importance of Intranet as a dissemination method. Moreover, the importance of some more traditional methods was highlighted as well. Regarding the **preferred information dissemination time in terms of urgency and frequency**, there was also very little variation in responses. Generally, all important information was needed urgently, whereas less important information was preferred to be received on a monthly or weekly basis.

The analysis of the **needs for the storage of information** did bring value only in the sense that everybody felt that the business information should be stored in one central database. So this question gave a confirmation for this factor, which was quite evident anyway.

The presentation of the needs regarding the last five interview elements was simply done by presenting the general conclusion of the analysis of these qualitative questions. Consequently, these questions had more significance in indicating organisational needs than individual ones. These needs are, however, very important when starting to implement the Business Intelligence programme in organisational level.

As a **conclusion** of the phase 2, it can be said that the objective of identifying the individual information needs within the company and providing a summary of the information needs of the organisation in general was more or less met. There are couple of more specific conclusions that can be made as well. First, it is difficult to evaluate the value of the open questions regarding individual needs, as these questions are relatively difficult to be analysed and even more difficult to be presented. Moreover, this kind of information is not rapidly utilisable, but may prove to be valuable on a longer term. Secondly, these open questions are difficult, if the people do not exactly know what is meant by the question. It is, for example, not necessarily known what is meant by the "quality-characteristic of information" or by an "information product". Consequently, the interaction between the interviewer and the interviewee has to be on a high level. On the other hand, it is questionable whether impulsive responses from the respondents should be preferred, as it might be more feasible to work with more specific predefined questions. Thirdly, the analysis of the needed information types is made much more efficient, if the responses are directly filled into existing tables or other formats. Finally, it has to be kept in mind that the analysis of needed information types does not indicate priorities, but just helps in creating lists and tables of information types. Thus, it merely tells about what types of information are needed, but does not give any indication of the intensity of the need.

In terms of concrete outcome, this phase 2 of the need analysis, first of all produced an "Information User & Provider Map", which can be further completed and updated along with the development of a Business Intelligence programme.

Secondly, this phase produced matrix tables presenting the needed information types within the earlier identified information categories. These tables are very valuable when designing the Business Intelligence programme based on the needs for business information content. A less concrete outcome, is the outline of the information needs in terms of structuring, analysing, disseminating, storing and utilising the information. This information is also valuable when designing the design and actual implementation for the Business Intelligence programme. Moreover, the interview documents can be later on utilised with the aim of meeting individual business information needs.

5.6. Conducting the Third Phase of the Need Analysis in the Case Company

According to the Information Cycle Approach the phase 3 includes the analysis of individual business information needs regarding most elements of the business information cycle and the dimensions of information need. The objectives of the phase 3 was the measurement of the quantifiable individual information needs within the company and a summary of the information needs of the organisation on average.

The phase 3 was started by formulating the company-specific survey structure based on the survey elements from the Information Cycle Approach that are presented in the following list. This **first step** was done by the researcher at the same time as the formulation of the interview structure for phase 2. In practice, the survey elements were converted to structured and not open-ended survey questions in which a distance-scale from 1-5 was decided to be used for measurement. According to Seppälä (1994, 92) a distance scale is the most common scale for measuring attitudes and satisfaction, and is thus suitable for measuring importance and satisfaction, which were the main purposes for the survey. Moreover, a scale with less than four points is not seen as differential enough, and a scale with more than seven points demands too much from the respondent (Seppälä 1994, 95). Consequently, the scale in this study was set from 1 to 5.

➢ **Survey Elements:**

1. Organisational location of the respondent in terms of strategic and operative position
2. Analysis of personal purposes for using the information by evaluating the importance of the factors mapped during phase 1
3. Analysis of the intensity of the needs for various types of information by evaluating the importance of the information types mapped during phase 1
4. Analysis of satisfaction regarding the current supply of information types mapped during phase 1
5. Analysis of the intensity of the information needs by geographical regions by evaluating the importance of the geographical regions mapped during phase 1
6. Analysis of satisfaction regarding the current supply of information regarding the geographical regions mapped during phase 1
7. Analysis of preferred information products by evaluating the importance of listed information products that may be based on existing information products within the company as well as on information products known to be useful in other organisations.
8. Analysis of needs for various dissemination methods of information by evaluating the importance of listed dissemination methods that may be based on existing methods within the company as well as on methods known to be useful in other organisations.
9. Analysis of the preferred information dissemination time in terms of urgency and frequency by evaluating the importance of listed time-frames.
10. Analysis of needs for the storage of information by evaluating the importance of listed storage approaches that may be based on existing approaches within the company as well as on approaches known to be useful in other organisations.

The structure that was used in the survey is attached in the end of this report (see Appendix 2). The surveyed factors for elements 2 (question 4), 5 (question 7) and 6 (question 8) were derived directly from the phase 1 of the need analysis, whereas the information types for the elements 3 (question 5) and 4 (question 6) were selected from the information types that were identified based on critical success factors in the phase 1. Moreover, element 1 (questions 1-3) was used merely to get background information on the respondent.

Most of the work during this first step was involved with the formulation of elements 7-10 (question 9), where there were no readily identified factors to be surveyed. In practice, it was seen as feasible to combine these four survey elements into one survey question as these dimensions can all be packed in the form of information products and often in a way that one product reflects various elements. The information products to be surveyed were created based primarily on the discussion in the theoretical part of this study (see chapters 3.8.-3.10.) and secondary on the researchers general knowledge on the field of business information. Some of these products were already used in the case company, but mostly they were derived from products used in other organisations.

The **second step** in phase 3 was then the testing of the survey structure. This was done right after the test interviews of phase 2 by letting the BI-project manager and the sales manager fill in the survey. In this testing phase, the duration for filling a survey was approximately five minutes, which was considered as being reasonable and not to stress people too much. The test gave positive feedback for the structure in general and one minor factor was added to question 9 in terms of an "Internal Intelligence Network Map", thus reflecting the usefulness of an "Information User & Provider Map", but with a little bit deeper approach in terms of what people know inside the organisation.

The **third step** in the phase 3 was then actually implementing the survey regarding the target group specified during the phase 1. In the Information Cycle Approach, it was indicated that the survey would be preferred to be done after the personal interview so that the responses in the actual interview would be impulsive. This indication was taken into consideration, and in practice, the survey was implemented so that right after the interview (phase 2) the survey was left for the interviewee with the purpose that he could fill it later and return it by fax or mail within an indicated deadline. In the cases of telephone interviews, the survey was sent by e-mail. From the 50 interviewees altogether 46 received the survey, of which 30 people completed and returned it.

In the middle of implementing the survey reserach process, it was decided within the analyst team to expand the target group of the survey in order to get a bigger number of responses to be analysed. Consequently, 32 additional target people for participating the survey were chosen based on the initial list of information users and providers. The survey was then sent to these people by e-mail with an indication of its returning to the BI-project manager. Of these 32 people, 12 completed and returned the survey.

Of the 42 survey responses received altogether, 22 were from people positioned in Finland, whereas the others were from Germany (10), the Netherlands (6) and other locations (4). The response rate for the survey can be considered as relatively low, as the survey was done internally and was even to be returned to a relatively high-ranked manager. Anyway, the total number of responses was considered as high enough for making analysis, as the idea was not to get results of statistical significance, but more rough indications of which factors are preferred and which are not. Moreover, the altogether 42 surveys represented more than 25 percent of the initial target group identified in the mapping of information users and providers, which can be considered as a good coverage.

The **fourth step** of phase 3, the actual analysis of the survey was done by first feeding the responses to the computer program MS Excel. This type of software was seen as adequate for the analysis as there was no intention to make any crosstabulations due to the small sample size. Moreover, the same software served well for the purpose of visualising the results, which was the **fifth step** and basically done at the same time with the analysis.

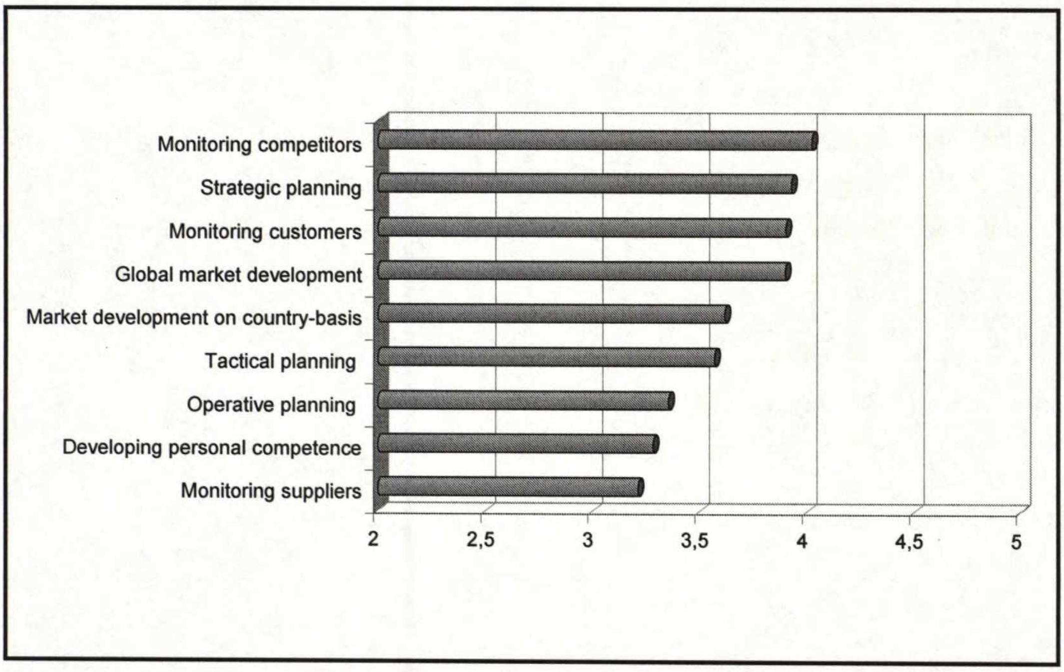
After the responses were fed to the software, the average values for the responses were calculated. These average values of individual needs were then summarised as presenting intensity of organisational needs for the factor in question. At this stage, individual answers were not analysed separately, but this data could be later used for the purpose of e.g. developing the Business Intelligence programme to respond to individual need profiles.

The purpose of the first three questions of the survey (see Appendix 2), was to give background information of the respondent. Thus, this data regarding the first survey element was only analysed in terms of checking that the person in question was placed in the correct box of the "Information User & Provider Map" presented earlier.

The purpose of questions 4 and 9 was to give straightforward indication of the purpose of information use (survey element 1) as well as preferences regarding proposed information products (survey elements 7-10). Thus, the analysis of both these questions was simply based on the average value of the responses on the scale from 1 (not at all important) to 5 (critical). These average values were then presented with horizontal bar charts. The following figure 27 presents an example of this type of bar chart in which the average needs in terms of use purpose of business information was presented.

The value of the results of these two questions (4 & 9) for the design phase of the Business Intelligence programme is considerable. First, the results of question 4 give indication of the overall direction in which the BI-programme should be developed according to its future users. It is important to take into account, the expressed importance of e.g. strategic planning instead of making BI a programme serving mainly operational level. Secondly, the results of question 9 give more specific indication of the information products that the future users feel that they need most. Thus, these preferences have to be taken into account when developing these information products that Business Intelligence programme should produce.

Figure 27. Presenting Average Needs in Terms of Use Purpose of Business Information

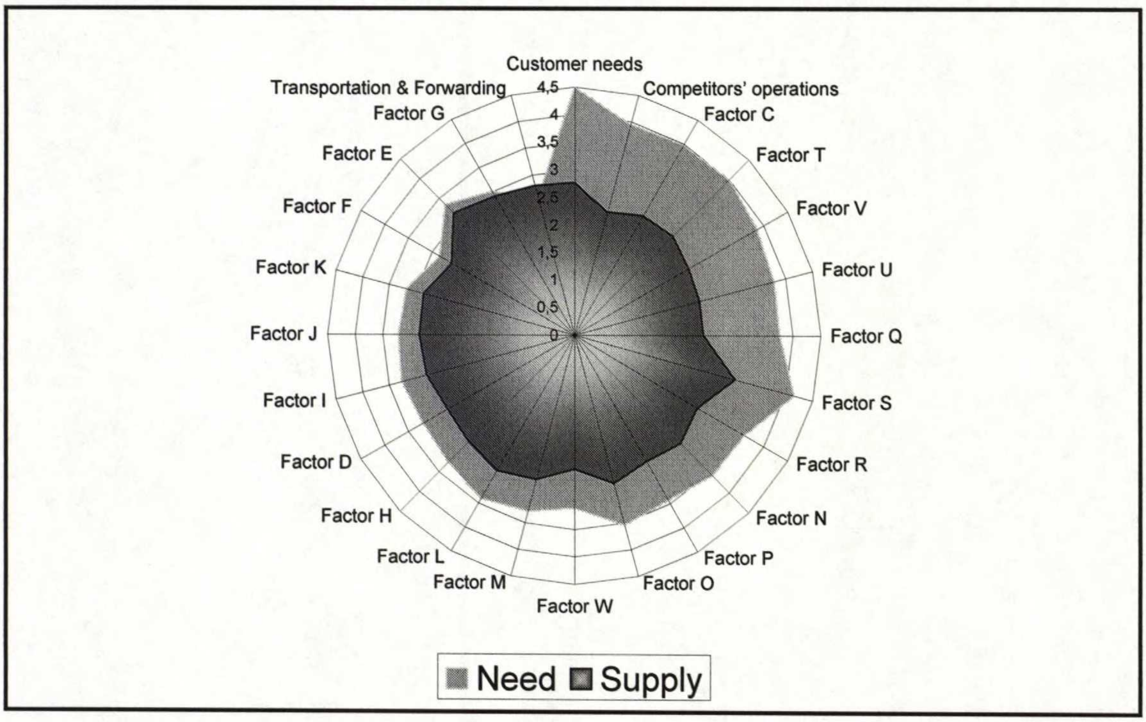


The questions 5 and 6 (survey elements 3 and 4) were formulated in order to measure information gap between the current supply and need for various types of business information. This simply means taking the average value for the expressed need for the specific type of information and subtracting the average value given for the current supply of the respective information type. The outcome presents then the value of average information gap regarding this specific type.

The Information Cycle Approach (chapter 4.8.3.) suggested the presentation of the information gaps by a intelligence gap table presented by Hedin (1998). While planning the presentation of the results it was, however, seen that this method is rather simple and does not really visualise the gaps in a good way. Consequently, a specific diagram was developed for this purpose, which is presented in the following figure 28.

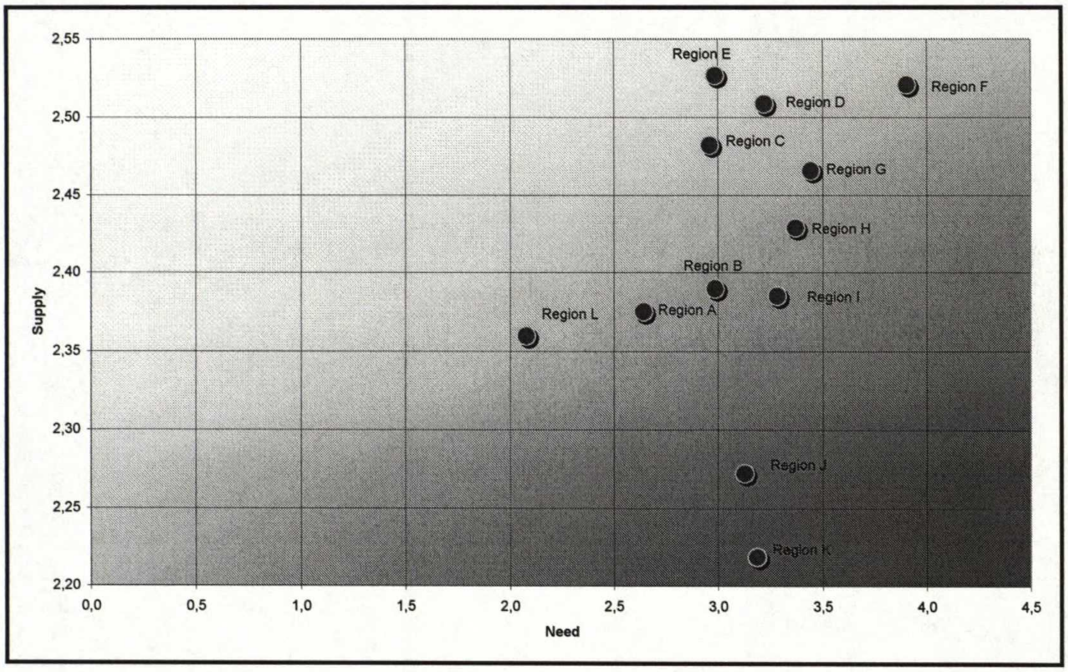
In the figure, the information need is presented by the light colour (the outer area in the figure), whereas the current supply is presented by the dark colour (the inner area in the figure). Thus, the diameter of the light area that is visible indicates the information gap of the information type in the respective spot. The information type where the gap is the largest is presented in the top of the diagram, and other types are presented clockwise from the top in the order of gap size. From the figure it can be inferred that the biggest information gap was expressed to be in getting information on customer needs, whereas information on transportation and forwarding was the only information type where the supply was higher than the actual need.

Figure 28. Presenting Gap Between the Need and Current Supply of Various Business Information Types



The questions 7 and 8 (survey elements 5 and 6) were similarly formulated in order to measure information gap between the current supply and need for business information regarding geographical market areas. The analysis of these questions was done similarly than the previous ones, but the visualisation was done little bit differently. Instead of using the previous kind of diagram, the gaps were presented in a two-diagonal chart, which is presented in the following figure 29. In the figure, the x-axis indicates the need for information on the specific geographical area, whereas the y-axis represents the current supply. Consequently, the lower the geographical area is presented in the chart, the lower is the current supply of information, and the more the geographical area is in the right side of the chart, the higher is the need. Thus, the information gap is highest in terms of information on Region K, which is presented in the lower-right part of the chart.

Figure 29. Presenting Gap Between the Need and Current Supply of Business Information by Geographic Regions



As a **conclusion** of the phase 3, it can be said that the objectives of measuring the quantifiable individual information needs within the company and making a summary of the information needs of the organisation on average were both met. However, the latter objective was considered as more important at this stage, and the individual needs were not analysed at this point. This data is, anyway, existing and can be later on utilised.

Generally, it seems that the factors used in the survey questions were well understood, even though there might have been some problems with some of the information products listed in question 9. Basically, the information products should be seen before one can make strong judgements on them. This limitation should thus be taken into account when utilising the analysis results. On the whole, it seemed to be a good approach that people are having ready-given factors at hand, which were to be evaluated, instead of respondents having to invent these things themselves as their knowledge on business information is often limited.

In terms of concrete outcome, this phase 3 was planned to produce a presentation of information gaps regarding information types and geographical areas as suggested by Hedin (1998). This kind of presentation was done, but not totally according to the method suggested by Hedin, which was not seen as highly visualised. Instead, various kinds of charts were used to visualise the results depending on the specific question. Another concrete outcome, is the MS Excel sheet which includes all the expressed information needs and information gaps on an individual level.

5.7. Summary of the Findings

The aim of the case study was to test the validity of the developed model and to bring up new aspects for its further development, related to previous discussion presented in the theoretical part of this study. In this respect, it can be said that the case study was very successful as it generally supported the Information Cycle Approach presented earlier, but also brought up many aspects for its further development. These major findings are discussed in the following paragraphs.

First of all, it could be said that the case strongly supported the highlighting of the importance of a need analysis when starting to build a systematic business information management system, which was brought up in chapter 4.1. The management of the case company had identified the necessity of a need analysis by themselves for various reasons which were presented in chapter 5.3. The primary reason was to get the commitment of future users for the development of a business intelligence programme. According to Kamppinen (1996, 101-104), the more involved the users are in the information requirement definition phase, the more likely they are to accept the system and utilise it correctly. It remains yet unsolved, whether the need analysis actually has this kind of effect in the case company, but based on the observation done by the researcher it seems highly likely.

On the whole, the situation in the case company reflected well the need for analysing business information needs in terms of various dimensions and not only regarding the needed types of information i.e. the information content. Thus the case study gave justification for a comprehensive need analysis model covering basically all dimensions of business information needs.

The analysis team in the case study was formed by combining in-house expertise and external expertise, which had been suggested by Finne (1996, 73) and discussed generally in chapter 4.2. Based on the observations done by the researcher as well as the feedback received from the case company representatives, this approach can be confirmed as a suitable method. The division of responsibilities, however, has to be very clear and done in a way that the competitive advantages within the analyst team can be utilised and group synergy can be created. Based on the experiences of the case study, it can also be concluded that for the external researcher it is extremely important to get an in-depth familiarisation to the company.

This case study also supports one of the major problems in need analysis brought up by Liukko (1994, 10) and discussed previously in chapter 4.6. As in other projects, key success factors for the need analysis are the motivation of the respondents and the respondent's understanding of the importance of the project. Often this is reflected in the time and effort that the managers are willing to and able to allocate for this kind of extra activity. This phenomenon was reflected in the case study, in terms of difficulties in arranging interview sessions and the relatively low response rate of surveys despite of being an internal project. On the other hand, this phenomenon is a reality of modern business life in general, and basically one has to accept that his own project is not the only issue that is competing for the time that the manager has.

The role of the company representative in terms of internal marketing is critical in order to get people inside the company committed to the project. This has to be taken into account especially with the actual development of a Business Intelligence programme, where it is more difficult to use external resources. At this point, it may be worth consideration to bring the external researcher to continue the project from inside the company, as most likely he has the most in-depth understanding of the company's business information needs despite of communicating the main findings to the company representatives.

In general, the case study supported the adaptability of the Information Cycle Approach well. As the scope of the analysis in the case company was defined to be extensive both in terms of contents (business information elements) and coverage (both organisational and individual needs), the Information Cycle Approach was generally adapted as the framework for the need analysis as such. As the Information Cycle Approach was developed as a flexible model, there would have been room for more specific adaptation, however.

The methods used in the case study served their intended purpose rather well. First, the brainstorming sessions were a good method for mapping the information needs on a rough level during the phase 1 of the analysis. If there are resources in the company, it can be suggested, however, that some of the brainstorming sessions would include a larger number of people, which might enhance the creation of new ideas and also increase general commitment of people to the project.

Secondly, personal interviews were especially important in getting people committed to the further development of a Business Intelligence programme. It is, however, difficult to evaluate the value of the open questions regarding individual needs, as these open responses are relatively difficult to be analysed and even more difficult to be presented. Consequently, the indication of the importance of spontaneity in the interviews made in the Information Cycle Approach can be criticised. Based on the case study, it seems that the analysis and presentation of the information needs brought up in the interview would be made lot easier if the questions will be more specific and there would be a ready-made structure in which the identified information types could be documented already during the interview. This approach has been previously supported by Tero Kaleva (Interview 1997) from *Metsä-Serla* company, who uses formalised working sheets in order to analyse and present the needs.

Thirdly, surveys were seen as a very suitable need analysis method as they produced the most concrete results both in terms of intensity of business information needs as well as the gap between the need and current supply of the factor in question. Moreover, these results can be easily visualised. The limitation of the method, however, is that all respondent are not familiar with all the factors included in the survey. Nevertheless, it seemed to be a good approach that people are having ready-given factors to be evaluated, instead of respondents having to invent these things themselves, as the business information needs are not necessarily conscious and may be difficult to express.

Furthermore, utilising the previous experience was also a very valuable working method, being used especially when formulating the interview and survey structure. Moreover, the existing strategic planning material in the case company highlighted many business information needs, which could be combined with the other results. In this case company, there were no existing information products or coordinated business information activities, which could have been used as a basis for assessing information needs. In a company with fairly developed system, the existing activities could be used as a basis for analysing the business information needs. It seems to be generally easier to derive ideas from something that is already existing rather than to create something totally new.

In the case study, all the three phases of Information Cycle Approach were decided to be included in the need analysis in the respective order. It proved to be well justified that the phase 1 should be conducted first as it served as laying foundation for the following two phases. Regarding the other two phases, it could be suggested, however, that it may be more feasible to conduct the survey before the actual interviews. In this way, the interviews could be used as a means to go deeper into the needs already measured by the survey. For example, if information on competitors' operations is assessed as critical in the survey, the interview could be used for identifying what types of information are needed regarding the competitors' operations. Moreover, if the surveys were to be done before the interviews, the actual response rate would increase to practically 100 percent, as it would be completed in the beginning of the interview at latest.

One of the cornerstones of Information Cycle Approach was to include the analysis of needs both on organisational level as well as individual level. Even though the acquired knowledge of individual business information needs is not going to be utilised in the case company in the short term, this information may be useful in further stages of developing the Business Intelligence programme. Moreover, the organisational business information needs are formed by the large number of individual needs, and thus the relevance of this cornerstone can be verified.

In terms of ultimate outcomes, the Information Cycle Approach first of all produced an "Information User & Provider Map", thus serving as an identification and visualisation of the information users in the company. Secondly, the importance of various use purposes for information were first analysed individually, based on which an organisational average was calculated and visualised by a bar chart. Thirdly, both the individual and organisational needs for various types of information were analysed, first, in terms of existence, being presented by specific information need matrixes, and, secondly, in terms of intensity being presented by an information gap analysis. The previous outcome applies to individual and organisational needs for business information regarding various geographical market areas as well. A less concrete outcome, was the outline of the business information needs in terms of quality-characteristics, form (structuring, conciseness and degree of analysis), dissemination method and time as well as storage of information. Preferences regarding these dimensions were then further explored to some extent producing some quantified information on preferred information products.

Based on the previous ultimate outcomes, it can be said that the Information Cycle Approach was successful in being able to produce some outcome on all the dimensions to be analysed. Nevertheless, it still remains unknown, how well these identified needs correspond to the actual business information needs of the case company. According to Pirttilä (1997, 47), it should be emphasised that actual business information needs can be assessed fully reliably only with hindsight. In addition, however sophisticated the method of assessing information needs from the organisational point of view, it is difficult to fully eliminate the subjective bias inherent in human estimation. Based on the case study experiences, this statement can be accepted, as in many cases the interviewees have just a very vague idea of the information that would be useful for them. Even though the need analysis would not produce fully reliable knowledge on business information needs, it can be seen as a successful one if it helps the company to develop its procedures into a more feasible direction. Moreover, a periodical or continuous update of the information needs will substantially increase the understanding of the actual needs.

6. Summary & Conclusions

6.1. Analysing Business Information Needs - Information Cycle Approach

This chapter presents the outcome of this Thesis, i.e. the "Information Cycle Approach" model for analysing business information needs in an internationally operating company. The following model is based on the initial model presented in chapter 4.8. as well as on the findings of the empirical study presented in the previous chapter 5.7. Some parts of the following text are repetition of the ideas presented earlier, but the aim of this chapter is to serve as a conclusive summary of the model rather than just indicate changes to the previous one.

The Information Cycle Approach is a comprehensive model for analysing business information needs. The model is not a ready-made tool for the companies to be used as such, but it has to be adapted specifically to the company in question. This adaptation requires lot of knowledge about the company and its organisation, the business environment in which the company is operating as well as the elements of this analysis model.

The Information Cycle Approach is based on the Business Information Need Cycle, which was presented in figure 18. In the cycle, the various dimensions of the business information needs, are illustrated based on the phases of managing business information flows in the company.

The Information Cycle Approach is not dependent on who the analyst is or who are forming the analyst team. In order to achieve high-quality results it is, however, suggested that this model is exploited by combining in-house expertise and external expertise. In this way, both the neutrality aspect as well as the organisational knowledge will be represented in the analysis.

The cornerstone of this model is the fact that it **takes into account both the organisational and individual business information needs and covers all the elements of business information need**. Methods to be used in the Information Cycle Approach include **brainstorming**, which can take place in focus group discussions and workshops, **personal interviews** and **surveys**. Furthermore, **checklists** and **previous experience** can be used as supportive methods especially in the brainstorming stage.

In the Information Cycle Approach, the analysis process is divided into three phases depending on the analysis method:

- Phase 1: Need Mapping on the Organisational Level by Brainstorming
- Phase 2: Need Analysis on the Individual Level by Survey
- Phase 3: Need Analysis on the Individual Level by Personal Interview

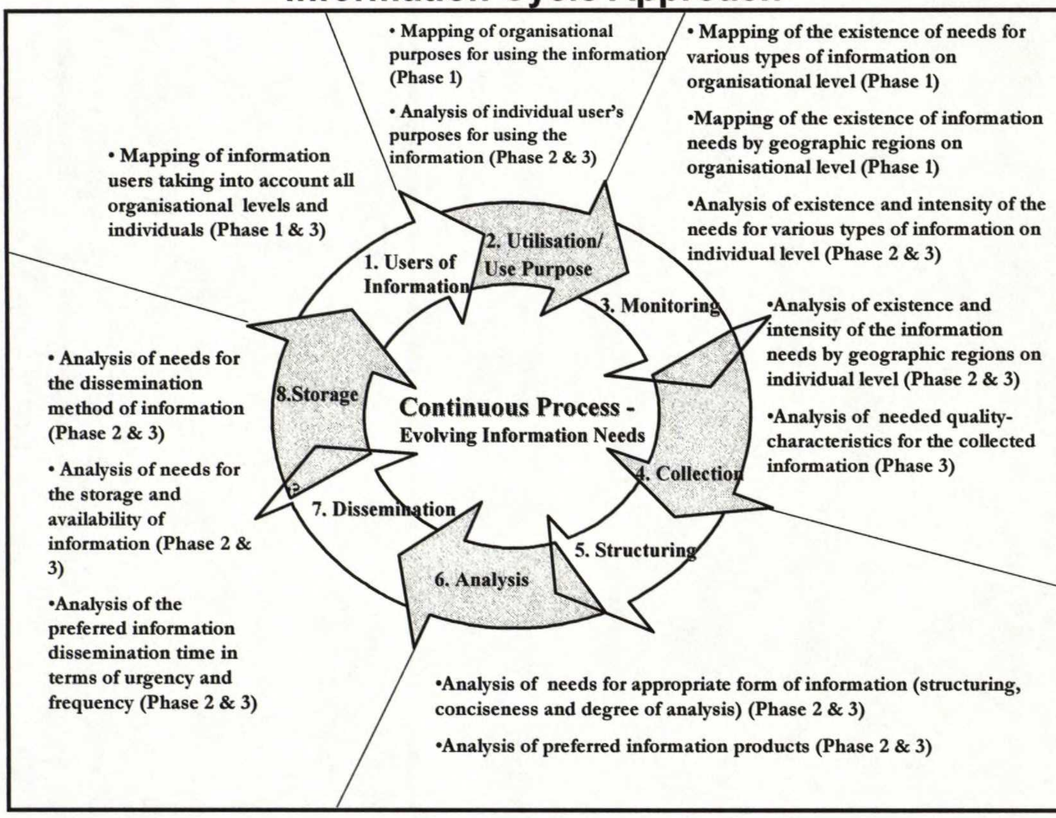
It is important to note, however, that the previous methods and phases can be used in a creative way and not all methods are necessarily to be used when analysing the needs in one specific company.

The Information Cycle Approach for analysing business information needs is illustrated in the next figure 30 presenting the contents of the model in more detail. First of all, it takes into account the analysis of the various dimensions of business information needs. These dimensions are linked with the specific phase of business information management cycle where the needs should have influence on the actions. For this reason, some phases of the cycle which are in connection with the same needs have been grouped in the following figure.

Secondly, the following illustration of the model (see figure 30) includes an indication of the analysis method to be used by indicating the phase of the analysis process where the specific dimension of the need is to be covered. Phase 1 is concentrated on mapping information needs on the organisational level and thus creating a basis for the next phases where the analysis is done more specifically on individual level. As the nature of analysis during this phase 1 is not very detailed this part of analysis is called as mapping of the organisational information needs. The phases 2 and 3, on the other hand, are focusing on analysing individual business information needs in a more detailed approach by the use of a survey (phase 2) and a personal interview (phase 3).

Thirdly, the dimension of evolving business information needs is illustrated in the core of the figure 30. As management of business information is a continuous process, also the analysis of information needs has to be done continuously or at least periodically. This on-going process of reviewing information needs should be incorporated as part of an on-going business information development programme and can be done by more informal discussions.

Figure 30. Analysing Business Information Needs - Information Cycle Approach



Even though this model is developed for internationally operating companies, the model is very well applicable for domestically operating companies as well. In this case, the scope is just more limited, and, for example, information needs regarding various market areas do not have to be analysed internationally but can be done by splitting the domestic market into various market areas, for example.

The phases of information cycle approach are presented in more detail in the following paragraphs. It should be pointed out that most of the following contents have been already presented in chapter 4.8. Nevertheless, it was considered more appropriate to present the whole model at this point of conclusion, rather than to just indicate changes to the initial model.

Phase 1: Need Mapping on the Organisational Level (Brainstorming)

- **Contents:** The phase 1 includes need mapping regarding the business information needs from an organisational point of view. This phase involves the following steps: i) mapping of organisational purposes for using the information, ii) mapping of the business information users and providers in the company, iii) selection of the target group to be included in the personal information need analysis by interviews and/or surveys, iv) mapping and categorisation of the existence of the needs for various types of information, and v) mapping and categorisation of the existence of business information needs by geographic regions.

- **Method:** The first step (i) has to be based on the overall purpose of the need analysis, which can be deepened in a brainstorming session. It is of utmost importance that the results of this step are approved by the top-management. The following two steps (ii and iii) can be done in brainstorming sessions between the need analyst and a representative of the company such as a business intelligence manager or a director with extensive background in the company. The mapping of the existence of the needs for various types of information as well as the mapping of existence of the business information needs by geographic regions are preferred to be done in focus group discussions involving information users in the organisation and possibly information providers within the company, so that the total number of people involved would be from 4-10. These people should be chosen from the target group for the business information system under development and can thus include information users from the strategic as well as operative level. Often, it is extremely difficult to find this kind of common time in today's hectic business conditions, and, consequently, this phase can be done by a smaller group as well. In this case, however, the experience of the participants has to be extensive within the organisation and regarding the role of business information in the organisational level. In practice, the analysis of the existence of the needs for various types of information is done by first assessing the company's business objectives that are planned to be reached within a certain amount of time, which typically is set at 3-10 years depending on the company. This is then followed by an assessment of critical success factors for the company which can be used as a basis for building a list of information types needed in the organisation on the whole, and making categorisation of these identified information types.

- **Objectives and Outcome:** The main objective of this phase is to create a basis for the second and third phase of the analysis of business information needs. This will first of all be done by starting to create an "Information User & Provider Map", which can be used as a basis for choosing the target group for the next phases of the need analysis i.e. the personal interviews and the survey. Secondly, an outcome of this phase should be a categorisation of business information types and geographic market areas, which can be used in the next phases of the need analysis with an aim to test these initial categories and to go deeper into detailed types of needed business information.

- **Questions per Step:**

1. What are the organisational purposes for using business information?

2. Who are the users and providers of international business information within the organisation?

    – Levels to Be Taken into Account:

    1. Group level: headquarters
    2. Division/Business Group level
    3. Strategic Business Area & Strategic Business Unit Level
    4. Regional level: regional headquarters
    5. Country level: country branch
    6. Functional levels in the previous stages:
        - Strategic planning
        - Marketing
        - Export/International Operations
        - Research & Development
        - Production
        - Finance
        - Information Technology
        - Logistics
    7. Team level
    8. Individual level

3. Who of the users and providers are the target group for the business information need analysis on individual level?

4. Mapping and categorisation of the existence of the needs for various types of information:
   - What are the business objectives of the company within a specified time (3-10 years)?
   - What are the critical success factors (CSF) for the company's success within the specified time (3-10 years)?
   - What types of information are needed in order to strengthen the company's position in terms of critical success factors and thus the business objectives?

5. Which geographical market-areas are the focal points of the information need within the specified time (3-10 years) and how should these areas be categorised?

Phase 2: Need Analysis on the Individual Level (Survey)

- **Contents:** The phase 2 includes the analysis of individual business information needs regarding most elements of the business information cycle and the dimensions of information need. This phase involves the following five steps: i) formulation of a company-specific survey based on the survey elements of phase 2 (see the list below) and the findings of the phase 1, ii) test surveys, iii) actual implementation of surveys, iv) analysis of the surveys, and v) visualisation of the results.

- **Method:** A formulated survey that can be received and returned by email, mail or fax. The questions are structured and not open-ended. The survey is preferred to be done before the personal interview so that the interview can be used for specifying the needs by more in-depth responses. It is, however, possible to conduct the survey also after or during the interview.

- **Objectives and Outcome:** Measurement of the quantifiable individual information needs within the company and a summary of the information needs of the organisation on average. The visualisation of the findings of this phase should be emphasised especially in terms of visualising the identified information gaps with an appropriate chart.

➤ **Survey Elements:**

1. Organisational location of the respondent in terms of strategic and operative position

2. Analysis of personal purposes for using the information by evaluating the importance of the factors mapped during phase 1

3. Analysis of the intensity of the needs for various types of information by evaluating the importance of the information types mapped during phase 1

4. Analysis of satisfaction regarding the current supply of information types mapped during phase 1

5. Analysis of the intensity of the information needs by geographical regions by evaluating the importance of the geographical regions mapped during phase 1

6. Analysis of satisfaction regarding the current supply of information regarding the geographical regions mapped during phase 1

7. Analysis of preferred information products by evaluating the importance of listed information products that may be based on existing information products within the company as well as information products known to be useful in other organisations. These listed products can also involve characteristics of the following dimensions of business information needs:

   a) Analysis of needs for various dissemination methods of information

   b) Analysis of the preferred information dissemination time in terms of urgency and frequency

   c) Analysis of needs for the storage of information

Phase 3: Need Analysis on the Individual Level (Personal Interview)

- **Contents:** The phase 3 includes the analysis of individual business information needs regarding the whole business information cycle and all the dimensions of information need. This phase involves the following five steps: i) formulation of a company-specific interview structure based on the interview elements of phase 3 (see the list below) and the findings from the phase 1, ii) test interviews, iii) actual interviews, iv) analysis of the interviews, and v) visualisation of the results.

- **Method:** A personal interview (face-to-face or telephone) based on pre-formulated and specific open questions with the responses documented directly into working sheets already during the interview.

- **Objectives and Outcome:** Identification of the individual information needs within the company and a summary of the information needs of the organisation in general. The needed information types can be visualised by information type matrixes presented earlier.

- **Interview Elements:**

1. Mapping of information users
    a) Personal positioning of the interviewee in the "Information User & Provider Map"
    b) Other people to be included in the "Information User & Provider Map"

2. Analysis of personal purposes for using the information
    a) Personal job responsibilities (in order to get deeper insight of the use purposes)
    b) Personal purposes for using the information

3. Analysis of existence of the personal needs for various types of information
    a) What information does the information user need to do his job effectively?

b) What types of information does the information user need within the company-specific information categories that were identified in the phase 1?

4. Analysis of existence of the personal needs by geographic regions

   a) Is the information need: a) global, b) regional or c) country-based?

   b) From which geographical market areas information is needed?

   c) Differences in what information is needed globally, regionally and on country-basis?

5. Analysis of needed quality-characteristics for the information

6. Analysis of needs for appropriate form of information

   a) How structured, concise and analysed should the information be when disseminated to you?

   b) Are there some certain information products that you need?

7. Analysis of needs for various dissemination methods of information

8. Analysis of the preferred information dissemination time in terms of urgency and frequency

9. Analysis of needs for the storage of information

6.2. Summary of the Study

This study has explored the area of analysing business information needs in an international business environment. The theoretical part of this study, which is divided into three chapters, is based on existing literature as well as benchmarking experiences from other companies derived from expert interviews and seminars. First of all, chapter 2 defined and explained general issues in the field of international business information and highlighted the importance of business information for internationally operating companies in more detail. Moreover, the current usage of business information in internationally operating companies was shortly examined as well to get background knowledge to the main issues.

Chapter 3, went comprehensively through the various dimensions of business information needs such as needed business information types, needs regarding geographical areas and needs regarding the form of information to be used. Chapter 4 then concentrated more specifically on previous academic as well as company-specific discussion and models regarding the problem of how to analyse the business information needs. In the end of the chapter 4, the chapter 4.8. presented a model for analysing business information needs in an internationally operating company based on the previous chapters and the conclusions drawn based on them. This model then acted as a framework for the empirical study as well.

In the empirical part of this Thesis which is covered in chapter 5, was started by choosing a case study to be the methodology for testing the previously developed model. After this the selected case company, the Business Group Communication Networks of *NKF Holding N.V.*, was presented shortly in chapter 5.2. in order to give background information on the case conditions. In the case study, the developed model was, first of all, adapted to the case company, which was documented in chapter 5.3. After this, the business information need analysis was conducted in practice according to the adapted model, the primary methods being brainstorming, face-to-face interviews and survey, which included questions of both quantitative and qualitative characteristics aiming to analyse and measure the "real business information needs" in the company. This section was documented in chapters 5.4.-5.6. and the findings were summarised in chapter 5.7.

All the previous chapters boil down to the previous chapter 6.1., which presents the outcome of the study, i.e. the "Information Cycle Approach" model for analysing business information needs in an internationally company.

6.3. Conclusions

The starting point for this Thesis was reflected in Jain's (1994, 333) comment on the difficulty of suggesting a general framework for classifying the information needs of all or any particular companies. Thus, every company should work out its own information categories, which may be based on one scheme or another.

Consequently, the main **research problem** of this Thesis was developed as follows:

> ***The analysis of business information needs in an internationally operating company has been determined to be one of the most critical stages when developing a systematic business information management system such as a business intelligence system. There is, however, quite a little research done on this specific subject and the academic world is lacking comprehensive models for analysing the business information needs, which could be applied to internationally operating companies.***

The above research problem was definitely found in the case company. There was a big need and strong commitment to develop a more systematic approach of managing business information. The analysis of actual business information needs was identified as a necessary step in pursuing towards the development of such a system, as there was limited knowledge of business information needs. Moreover, a need analysis was seen as a necessity in order to get people more committed to the actual building process of the business information system. However, there was no special knowledge about analysing business information needs within the company, and no existing procedures as previously this kind of activity had only been done unsystematically.

The primary **research question** of this Thesis was derived from the research problem:

> ***How should business information needs be analysed in an internationally operating company?***

The **objective** of this study was

> ***to develop a comprehensive model for the analysis of business information needs which can be applied to internationally operating companies in general.***

In order to answer the primary research question and to meet the objective, this Thesis first of all summarises and categorises the dimensions for business information needs in chapter 3 based on previous discussion. Secondly, chapter 4 presents current models and guidelines of analysing business information needs and discusses their appropriateness and comprehensiveness. Finally, this Thesis presents a model for analysing the business information needs, which has been tested in a case-company and further developed based on the experiences.

The developed model presented in the previous chapter 6.1. is giving a guideline for analysing business information needs in an internationally operating company. Moreover, it can be considered as a comprehensive model including all the dimensions of business information need. Finally, the model has been applied and tested in one case company with fair results. Thus, it can be concluded that this Thesis answers the set research question and initially meets the determined objective.

It is quite difficult to state any accurate criteria for evaluating the value of the model, as there is no measure for how much it helps in the discovery of the actual business information needs. However, if the business information needs determined to be the most essential seem to help in setting priorities in the building of a business intelligence process and this direction can be later on verified as being a suitable one for the company, the model does have value in helping to guide the building process.

According to Yin (1989, 21), the aim of a case study is to be generalisable to theoretical propositions, not to populations or universes, thus expanding and generalising theories, not enumerating frequencies. In this study, the case study was used to test the developed model, and prove its validity. The theoretical base of the model is very general in terms of not being tied to any specific industry and being independent of company size, which suggests its usefulness in any internationally operating company.

A restriction to the generalisability of the model is its testing being limited to only one case company. Thus, in order to verify the successfulness of the developed model, more experiences from different kinds of internationally operating companies are needed both in terms of the successful adaptation of the model as well as its capability of analysing the actual business information needs.

6.4. Theoretical and Managerial Implications

Generally, the academic contribution of this Thesis is in the fact that it is one of very few studies that are entirely focusing on business information needs in internationally operating companies. As it was brought up in chapter 1.2., there is relatively large amount of research done in the area of business information, but only few of the authors have taken the need for business information to be the core element of their study.

More specifically, this study intended to contribute on the previous academic discussion by trying to partially fill the research gaps presented in chapter 1.2. First, this Thesis aimed at being a report, which would put the various dimensions of business information need together with a comprehensive approach, as most of the research done has concentrated in only what types of information are needed by international companies. This is done in chapter 3, which is totally focusing on examining the various dimensions of business information need. Secondly, this Thesis aimed at presenting a comprehensive model of how to identify, measure and analyse the needs for business information in internationally operating companies. This model was developed and then tested in a case company, leading to a presentation of the further developed model in chapter 6.1. The value of the model for academic discussion is in conceptualising the entire process for analysing business information needs in an internationally operating company.

When positioning this study to the previous discussion on this specific field, it can be concluded that this study in general follows the path initialised by Swedish academics and consultants. In the academic world, the most extensive previous research in the field has been done by Per Frankelius from the University of Linköping and Carl-Gustaf Rosén from the Royal Technical University in Stockholm. Moreover, Hans Hedin, who has contributed to this field of research in the University of Lund has adapted some models from the previous gentlemen and developed them further into consultation products as well.

In general, the findings of this study can not be compared directly with previous research, as the scope is very different than in any other known previous study. More specific comparisons between this study and previous discussion within this research area have been presented in chapter 5.7.

As a managerial implication, this study first of all emphasises the importance of business information in the international and rapidly changing environment, and secondly, highlights the importance of knowing the actual business information needs both on the organisational level on the whole as well as on the individual level. Business information is getting increasingly important in the rapidly changing environment and in many fields of business it is one of the most important competitive tools. On the other hand, the current flow of information is overwhelming and in order to make the information an actual competitive too, one has to be able to devote one's efforts in the key areas of information. For defining the key areas, an analysis of the actual business information needs is a necessity.

More specifically, this study emphasises the importance of a need analysis when starting to develop the business information management procedures in the company. In order to make this kind of project successful, the management has to show strong commitment and devote time for this kind of activity. A need analysis is a way to internally market the procedures to be developed by letting the future users to have a say already in the design phase.

For practising management of the case company, the value of the developed model lies in its outcome i.e. the results of the need analysis. The results will direct the building process of a business intelligence process showing existence and priorities of information needs in various parts of the organisation. On the other hand, the model can be further used when updating business information needs in the case company.

A business implication for the developed model is its possible use as a consulting product in relation to building management systems for international business information. Being a model that can be adapted to a company on a case-by-case basis, it provides good opportunities for further exploitation.

6.5. Suggestions for Further Research

As it has been previously mentioned, this area of research is still relatively untapped, and thus there is lots of room for further contribution. One of the main contributions of this study is thus in laying the foundation for further research.

In order to make the presented model more reliable and complete the following actions could be taken:

- Adapting the model to several case companies and further testing its validity, as the results of one case research give a good basis for other researchers to investigate whether the same reasoning applies for other cases as well. In this way generalisable theory may evolve based on this model.

- Development of a method for success measurement of analysing actual business information needs.

- After the model has been used in various internationally operating companies and a method for its success measurement has been done, the model's reliability could be tested with a quantitative study of how well it analyses the actual business information needs.

- Specific research could be done regarding the adaptation of the model for small and large companies.

- Specific research could be done regarding the adaptation of the model for domestically operating companies.

To conclude, as a field of research, analysing business information needs offers challenging research paths to be followed.

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Appendix 1. Interview Structure for Analysing Business Information Needs in the Case Company

Mapping of Information Users:

1. Name and Title

2. Position in terms of strategic and operative structure

3. Could you name other information users and providers within your operational organisation (names & job description)?

Purposes for Using the Information:

4. What are your job responsibilities?

5. For what purpose do you need business information?

Needs for Various Types of Information:

6. What types of business information do you need in order to do your job effectively?

7. In your area of responsibility, in which competitors are you most interested?

8. What kind of information would you like to know about these competitors?

9. In your area of responsibility, in which customers are you most interested?

10. What kind of information would you like to know about these customers?

11. In your area of responsibility, in which suppliers are you most interested?

12. What kind of information would you like to know about these suppliers?

13. In your area of responsibility, in which production and/or process technologies are you most interested?

14. In your area of responsibility, in which networks technologies are you most interested?

15. In your area of responsibility, what types of information do you need regarding the communication networks market development?

16. In your area of responsibility, what types of information do you need regarding the country development?

17. Do you have any acute information needs currently?

18. What kind of information do you need for the 1999 strategy process?

Information Needs by Geographical Regions:

19. Is your information need global, regional or country-based?

20. From which specific geographical market-areas do you need information?

21. Are there some differences in what kind of information you need globally, regionally and on country-basis?

Needed Quality-characteristics for the Information:

22. What are your quality preferences for the acquired information?

Needs for Form of Information:

23. How structured, concise and analysed should the information be when disseminated to you?

24. Are there some certain information products that you need?

Needs for Various Dissemination Methods of Information

25. How should the information be disseminated to you?

Needs in Terms of Urgency and Frequency of Dissemination:

26. How urgently and frequently should the needed information be disseminated to you?

Needs Regarding Storage of Information:

27. How should the information be stored and made available to you?

Appendix 2. Survey Structure for Analysing Business Information Needs in the Case Company

1. Name:

2. Title:

3. Unit (company & country):

4. For which purpose do you need international business information? Please assess the importance of the following factors by using a scale from 1 (not at all important) to 5 (critical).

1 = not at all important
2 = somewhat important
3 = important
4 = very important
5 = critical
blank = don't know

	Not at all important 1 (X)	2 (X)	3 (X)	4 (X)	Critical 5 (X)
a) strategic planning & decision making					
b) tactical planning & decision making					
c) operative planning & decision making					
d) monitoring competitors					
e) monitoring customers					
f) monitoring suppliers					
g) monitoring global market development					
h) monitoring market development on country-basis					
i) developing personal competence					
j) other purpose, what?					

5. How intense are your information needs regarding the following information types within the next 5 years? Please assess the importance of the following factors by using a scale from 1 (not at all important) to 5 (critical).

	Not at all important 1 (X)	2 (X)	3 (X)	4 (X)	Critical 5 (X)
a) Customers' operations					
b) Customer needs					
c) Competitors' operations					
d) Competitors' products & services					
e) Suppliers' operations					
f) Suppliers' products & services					
g) Contractors' operations					
h) Global technology development					
i) Convergence					
j) Value chain evolution					
k) Global market demand (volume & value)					
l) Global market supply (competition)					
m) Market demand on country-basis (volume & value)					
n) Market supply on country-basis (competition)					
o) Projects					
p) Political environment (country-based)					
q) Legislative environment (country-based)					
r) Economic environment (country based)					
s) Investment environment (country-based)					
t) Technological environment (country-based)					
u) Finance					
v) Production process technology					
w) Transportation & forwarding					
x) Information technology					
Other type, what?					
Other type, what?					

6. How satisfied are you with the information that you currently receive on the following information types? Please assess the level by using a scale from 1 (not at all satisfied) to 5 (extremely satisfied).

	Not at all satisfied 1 (X)	2 (X)	3 (X)	4 (X)	Extremely satisfied 5 (X)
a) Customers' operations					
b) Customer needs					
c) Competitors' operations					
d) Competitors' products & services					
e) Suppliers' operations					
f) Suppliers' products & services					
g) Contractors' operations					
h) Global technology development					
i) Convergence					
j) Value chain evolution					
k) Global market demand (volume & value)					
l) Global market supply (competition)					
m) Market demand on country-basis (volume & value)					
n) Market supply on country-basis (competition)					
o) Projects					
p) Political environment (country-based)					
q) Legislative environment (country-based)					
r) Economic environment (country based)					
s) Investment environment (country-based)					
t) Technological environment (country-based)					
u) Finance					
v) Production process technology					
w) Transportation & forwarding					
x) Information technology					
Other type, what?					
Other type, what?					

7. How intense are your information needs regarding the following geographical market-areas within the next 5 years? Please assess the importance of the following factors by using a scale from 1 (not at all important) to 5 (critical).

1 = not at all important
2 = somewhat important
3 = important
4 = very important
5 = critical
blank = don't know

	Not at all important 1 (X)	2 (X)	3 (X)	4 (X)	Critical 5 (X)
a) The Netherlands					
b) Finland & Baltic States					
c) Germany					
d) Other EU-countries (+ EEA)					
e) Central and Eastern Europe					
f) Russia and CIS-countries					
g) Middle East					
h) Africa					
i) Asia					
j) Australia and Oceanic					
k) North America					
l) Latin America					

8. How satisfied are you with the information that you currently receive on the following geographical market-areas? Please assess the level by using a scale from 1 (not at all satisfied) to 5 (extremely satisfied).

1 = not at all satisfied
2 = somewhat satisfied
3 = satisfied
4 = very satisfied
5 = extremely satisfied
blank = don't know

	Not at all satisfied 1 (X)	2 (X)	3 (X)	4 (X)	Extremely satisfied 5 (X)
a) The Netherlands					
b) Finland & Baltic States					
c) Germany					
d) Other EU-countries (+ EEA)					
e) Central and Eastern Europe					
f) Russia and CIS-countries					
g) Middle East					
h) Africa					
i) Asia					
j) Australia and Oceanic					
k) North America					
l) Latin America					

9. How do you view the importance of the following information "products" regarding your job responsibilities? Please assess the importance of the following factors by using a scale from 1 (not at all important) to 5 (critical).

1 = not at all important
2 = somewhat important
3 = important
4 = very important
5 = critical
blank = don't know

	Not at all important 1 (X)	2 (X)	3 (X)	4 (X)	Critical 5 (X)
a) All information in database available for colleagues within the company					
b) Competitor profiles					
c) Supplier profiles					
d) Customer profiles					
e) Contractor profiles					
f) Tailor-made market research reports					
g) Published multi-client market research reports					
h) Technology reviews					
i) Monthly industry intelligence bulletin by e-mail					
j) Weekly industry intelligence bulletin by e-mail					
k) Project information					
l) Internal Intelligence Network Map (Who is who in terms of information?)					
m) E-mail alerts (projects etc.)					
Other product, what?					
Other product, what?					